

A revision of the endemic Madagascan genus *Triplatyx* (Hemiptera: Heteroptera: Pentatomidae)

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Abstract. The endemic Madagascan genus *Triplatyx* Horváth, 1904 (Pentatomoidea: Pentatomidae: Pentatominae: Triplatygini) is redescribed. Five species are recognized, two of them being new: *T. bilobatus* Cahan, 1952, *T. dubius* Jensen-Haarup, 1931, *T. kerzhneri* sp. nov., *T. quadriceps* Horváth, 1904, and *T. stysi* sp. nov. All species are (re)described, including the so far unknown male and female genitalia and important characters are illustrated. The lectotype of *T. quadriceps* is designated. The first known larva of the genus (*T. quadriceps*) is described and first data on its bionomics are included.

Key words. Heteroptera, Pentatomidae, Pentatominae, Triplatygini, taxonomy, new species, lectotype designation, key, male and female genitalia, Madagascar

Introduction

HORVÁTH (1904) established the genus *Triplatyx* to accommodate a single new species from north-eastern Madagascar, *T. quadriceps* Horváth, 1904. JENSEN-HAARUP (1931) described an additional species, *Triplatyx dubius* Jensen-Haarup, 1931, based on a single teneral female. Subsequently, CACHAN (1952) diagnosed the genus and both known species, described an additional new species, *Triplatyx bilobatus* Cahan, 1952, and presented a key. In the following five decades, nothing was published on this genus except of the tribal name being mentioned twice by CASSIS & GROSS (2002) and RIDER (2008).

Triplatyx and the genera *Anoano* Cahan, 1952 (two species) and *Tricompastes* Cahan, 1952 (one species) are currently classified in the pentatomine tribe Triplatygini, erected by CACHAN (1952). All of them are endemic to Madagascar (CACHAN 1952, SCHOUTEDEN 1954).

In this paper the genus *Triplatyx* and the three previously known species are redescribed (including the so far unknown male and female genitalia) and additional two new species are described. First data on the bionomics of the genus are also included.

Material and methods

Quoting the labels of type specimens, a slash (/) is used to divide data on different rows of one label, a double slash (//) is used to divide data on different labels, and author's comments are given in square brackets []; the following abbreviations are used: hw = handwritten, p = printed.

Examined specimens belong to the following collections:

- BMNH Natural History Museum, London, United Kingdom;
- EHIA Ernst Heiss Collection, Tiroler Landesmuseum, Innsbruck, Austria;
- HNHM Hungarian Natural History Museum, Budapest, Hungary;
- MNHN Museum National d'Histoire Naturelle, Paris, France;
- NMPC National Museum, Praha, Czech Republic;
- ZJPC Zdeněk Jindra Collection, Praha, Czech Republic;
- ZMAS Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia;
- ZMUH Zoologisches Museum, Universität von Hamburg, Hamburg, Germany.

Dry-mounted specimens were studied under binocular stereomicroscopes Leica MZ75, MBS-10 and Olympus SZX9. Measurements were made with an ocular micrometer attached to MBS-10. The following measurements were taken: body length (from apex of paraclypei to apex of membrane), head length (from apex of paraclypei to the anterior pronotal margin), head width (maximum width across eyes), vertex width (between eyes), length of antennomeres (maximum length), pronotum length (medially in most exposed view), pronotum width (maximum width between apices of humeral angles), scutellum length (medially from base to apex), scutellum width (maximum width at base), and abdomen width (maximum width across laterotergites III or IV). The characters constant in all species of the genus are omitted in the species (re)descriptions.

The dissections and line drawings of structures other than genitalia were made under a Leica MZ75 stereomicroscope with an attached camera lucida. Male and female genitalia were examined under an Olympus SZX9 stereomicroscope and the line drawings traced from photographs. For the study of genitalia, specimens were softened in hot water and the male pygophore or female abdomen were removed under a stereomicroscope using sharp pincers, put into a 10% solution of KOH and heated until the solution started to boil. After the treatment in KOH the pygophores / abdomens were dissected and mounted on a piece of cardboard, the phalli were mounted on translucent plastic cards in water-soluble dimethyl hydantoin formaldehyde resin (DMHF), and female internal genitalia were stored in PVC microvials with glycerol. All were attached to the same pin as the dissected specimen.

The terminology follows KMENT (2005; metathoracic scent glands), DAVIDOVÁ-VILÍMOVÁ & PODOUBSKÝ (1999; dorso-abdominal scent glands), and DUPUIS (1970), SCHAEFER (1977), GRAZIA et al. (2006), GAPON & KONSTANTINOV (2006), and PLUOT-SIGWALT & LIS (2008; all male and female genitalia).

The photographs were taken by an Olympus Camedia C-5060 digital camera attached to an Olympus SZX9 stereomicroscope (partly using the ANALYSIS imaging software) or using a hand-held digital camera Nikon Coolpix 4500. The base map of Madagascar was downloaded from the On-line Map Creation website at <http://www.aquarius.geomar.de/omc>.

Results

Key to the Triplatygini genera and species of *Triplatyx*

- 1 Large (body length 17-22 mm). Head and anterior part of pronotum, in lateral view, inclined nearly orthogonally downwards. Lateral margin of each laterotergite with two sharp triangular projections. Body brown, humeral angles black, connexivum with alternating black and yellow spots. *Tricompastes* Cachan, 1952: *T. gigas* Cachan, 1952
- Small (body length 4.7-8.4 mm). Head and anterior part of pronotum, in lateral view, inclined downwards at a sharp angle. Lateral margin of laterotergites sinuate or straight, lacking sharp triangular projections. Body uniformly pale to dark brown or pale ochraceous. 2
- 2 Body more elongated, pale ochraceous. Head lacking anteocular spines. Humeral angles of pronotum markedly produced anteriorly, narrowing, and usually with bifid apices. Scutellum dorsally flat, without a hump. Lateral margins of laterotergites straight.
..... *Anoano* Cachan, 1952 (*A. pronotalis* Cachan, 1952, *A. milloti* Schouteden, 1954)
- Body shorter and wider, brown. Head with one anteocular spine on each side. Humeral angles of pronotum produced laterad and less markedly anteriorly, wide and with widely rounded to nearly quadrangular apices. Scutellum often bearing a dorsal hump. Lateral margins of laterotergites more or less sinuate. *Triplatyx* Horváth, 1904 3
- 3 Small (body length 4.7-5.1 mm), dark to blackish brown. Head nearly quadrangular, its anterior margin setose (Fig. 1). Pronotum dorsally uneven, bearing large pale triangular elevation in anterior part; anterolateral angles not carinate, spinose (Figs. 8, 67, 70); in lateral view, pronotum depressed posteriorly, forming sharp angle with anterior surface of scutellum; scutellar disc with high, conical hump in its anterior half (Fig. 71). Lateral margin of connexivum strongly sinuate (Figs. 29, 67). Legs off-white, lacking small dark spots, femora extensively dark brown basally (Fig. 68). *T. bilobatus* Cachan, 1952
- Large (body length 5.0-7.5 mm), pale to dark brown. Head quadrangular to trapezoid (widening towards apex), its anterior margin without setae (Figs. 2-4, 7). Pronotum dorsally usually flat, lacking pale triangular elevation in anterior part; anterolateral angles carinate, bearing usually only one short spine (Figs. 9-14); in lateral view, pronotum rather flat posteriorly, forming obtuse angle or confluent with anterior surface of scutellum (Figs. 72-75). Lateral margin of connexivum weakly sinuate (Figs. 30-34). Legs brownish with small dark spots (Fig. 83). 4
- 4 Larger (body length 6.1-7.5 mm), pale brown. Head nearly quadrangular, sides of paraclypei regularly rounded (Fig. 7). Humeral angles of pronotum very large, almost quadrangular, distinctly turned upwards (Fig. 14). Scutellum dorsally with very high, conical hump (Fig. 75), posteriorly bearing prominent longitudinal ridge (Fig. 82). Metathoracic scent gland with ostiole oriented laterad (hardly visible from above), auricle large (about twice longer than ostiole wide; Fig. 23). Evaporatorium large, especially on mesopleura (Fig. 25). *T. stysi* sp. nov.

- Smaller (body length 5.0-7.1 mm), pale to dark brown. Head trapezoid, sides of paraclypei distinctly produced laterad (Figs. 2-4). Humeral angles of pronotum smaller, usually widely rounded, hardly or not turned upwards (Figs. 9-13). Scutellum dorsally with moderately high, rounded hump (Figs. 65-66, 73-74), or weakly and regularly convex (Figs. 64, 72), posteriorly usually lacking longitudinal ridge. Metathoracic scent gland with ostiole oriented ventrolaterad (well visible from above), auricle small (less than twice longer than ostiole wide; Figs. 20-22). Evaporatorium small, forming only very narrow strip on mesopleura along its posterior margin (Figs. 16-17, 24). 5
- 5 Pygophore with posterolateral angles sharply pointed; ventral wall posteromedially with deep round depression; ventral rim missing, ventral rim infolding directed posteriad, not bent, shallowly and widely V-shaped medially, lateral projections low, rectangular, apically sharp, shifted laterad towards posterolateral angles (Figs. 37-38). Paramere as in Fig. 49, with apex in situ directed laterad (Fig. 37). Hump on scutellum high (Fig. 73). Humeral angles quadrangular; pronotum and scutellum medially with longitudinal callose line (Fig. 12). Auricle very small, about as long as ostiole wide (Fig. 21). Body length ♂ 5.4 mm. ***T. kerzhneri* sp. nov.**
- Pygophore with posterolateral angles rounded (Figs. 41-42, 44-45); ventral wall different; ventral rim infolding bent upwards, shallowly concave medially, lateral projections rectangular, not shifted laterad (Figs. 41-46). Paramere different (Figs. 48, 50), with apex in situ directed dorsolaterad (Fig. 44). Hump on scutellum high or absent. Humeral angles widely rounded; pronotum and scutellum medially without longitudinal callose line (Figs. 9-11, 13). 6
- 6 Pygophore with ventral wall gradually merging into ventral rim infolding, neither of them deeply depressed subapically at base of posterolateral angles; lateral rim of posterolateral angles wider (Figs. 41-42); lateral rim infolding dorsally with semi-circular projection (Fig. 42, red arrow). Paramere as in Fig. 48. Scutellum usually without a dorsal hump, more rarely with a high one (Figs. 64-66). Auricle slightly larger, less than twice as long as ostiole wide (Fig. 20). Body length ♂♂ 5.0-5.4 mm, ♀♀ 5.4-6.0 mm. ***T. dubius* Jensen-Haarup, 1931¹⁾**
- Pygophore with ventral wall gradually merging into ventral rim infolding, both deeply depressed subapically at base of posterolateral angles; lateral rim of posterolateral angles narrower (Figs. 44-45); lateral rim infolding dorsally with tooth-shaped projection (Fig. 45, red arrow). Paramere as in Fig. 50. Scutellum always with high dorsal hump (Fig. 74). Auricle very small, about as long as ostiole wide (Fig. 22). Body length ♂♂ 6.0 mm, ♀♀ 6.3-7.1 mm. ***T. quadraticeps* Horváth, 1904**

¹⁾ During the proof-reading, I received three specimens of an additional undescribed *Triplatyx* species from St. Augustin (= Ianantsony) in western Madagascar; the new species is habitually identical with *T. dubius* and differs only in the structure of pygophore. Therefore, a correct identification of females of *T. dubius* seems to be impossible.

Taxonomy

Triplatygini Cachan, 1952

Triplatyxaria Cachan, 1952: 315, 373. Definition, key to tribes and genera.

Triplatyxini: CASSIS & GROSS (2002): 433. List of tribes (based on 'Rider, in litt.').

Triplatyxini: RIDER (2008). List of tribes.

Etymology. HORVÁTH (1904) ESTABLISHED THE GENERIC NAME *Triplatyx* without any explanation of its etymology. However, the suffix *-yx* clearly suggests that the name was derived as a Greek word. Therefore, the correct spelling of the tribe is Triplatygini (see ICZN 1999: 29.3.1.). Cachan (1952) established the family-group name incorrectly as Triplatyxaria. David A. Rider corrected the ending to Triplatyxini on his web page (see Rider 2008), which was adopted by Cassis & Gross (2002). Triplatyxini was not used in any other work and there is no reason to maintain this spelling according to the Article 29.5. of ICZN (1999).

Triplatyx Horváth, 1904

(Figs. 1-25, 28-86)

Triplatyx Horváth, 1904: 255-256. Type species: *Triplatyx quadraticeps* Horváth, 1904, by monotypy.

Triplatyx: BERGROTH (1908): 156. Catalogue.

Triplatyx: KIRKALDY (1909): 201. Catalogue.

Triplatyx: CACHAN (1952): 373-374. Diagnosis, key.

Redescription. Colouration and sculpture. Basic colouration pale to dark brown, antennae and legs usually paler. Body densely and coarsely punctate, here and there with irregularly distributed small impunctate callosities between punctures; on pronotum and scutellum, callosities sometimes merging into longitudinal callose line.

Structure. Body markedly convex dorsally, convex to nearly flat ventrally. Small species, females slightly larger than males; body length: ♂♂ 4.7-6.8 mm, ♀♀ 5.4-7.5 mm.

Head (Figs. 1-7) declivous, shorter than wide across eyes, nearly quadrangular to trapezoidal in outline (anteriorly wider than posteriorly), behind eyes convex, laterally rounded; posterior margin nearly straight in middle, sunken into pronotum. Lateral sides in front of eyes deeply (Fig. 1) to slightly (Fig. 3) sinuate and bearing distinct triangular anteocular spine; paraclypei foliaceous, slightly depressed medially to nearly flat, long and wide, meeting in front of clypeus, regularly rounded laterally and anteriorly with small angle between both paraclypei against tip of clypeus, or with straight sides, widening anteriorly, then shortly and strongly arcuate mesad with anterior margin nearly straight. Clypeus slender, narrowing and closed anteriorly, slightly convex to nearly flat. Frons usually only slightly convex. Eyes small, protruding by ca. half of their width from outline of head; temples behind eyes narrowing laterad, not surpassing eye laterally. Ocelli small, situated posteriorly and medially behind eyes near posterior margin of head, but remote from anterior margin of pronotum. Antenniferes small, not visible from above (Fig. 5). Antennae slender, antennomeres ranked from shortest to longest usually as $1 \leq 3 \leq 2 < 4 < 5$; antennomere 1 cylindrical, shortest, as stout as or slightly more slender than antennomere 5; antennomere 2 cylindrical, most slender of all; antennomere 3 cylindrical, slightly thickening towards apex; antennomeres 4 and 5 spindle-shaped, antennomere 4 stouter than 3, antennomere 5 stoutest; apex of antennomere

2 and entire antennomere 3 with sparse, and antennomeres 4 and 5 with dense pale semierect setae. Bucculae (Fig. 5) long and low, lower margin straight or slightly insinuated medially, regularly narrowing anteriorly and evanescent (only in *T. bilobatus* not narrowing, anteriorly rectangular), posteriorly nearly rectangular. Rostral segment 1 not higher and distinctly shorter than bucculae, not surpassing their posterior margin; apex of rostrum reaching anterior margins of metacoxae or situated between them (Fig. 68).

Pronotum (Figs. 8-14, 70, 78) about three-times wider than long; anterior margin deeply emarginated with sides rounded laterally and, nearly straight medially; anterolateral angles truncated, usually with distinct lateral spine; anterolateral margins slightly to deeply concave, usually carinate, with one or more spines; humeral angles large, markedly produced laterad and more or less distinctly anteriorly and dorsad, laterally widely arcuate to truncate with margin sinuate to spinose; sides of pronotum behind humeral angles arcuate to nearly straight, narrowing towards scutellum; posterior margin of pronotum straight to slightly concave in middle. Disc nearly flat in middle, anteriorly with more or less developed elevation and/or impunctate median ridge (Figs. 8-14); posterior part more or less convex.

Scutellum approximately triangular, as long as wide; basal angles shallowly depressed, with small callose grain usually present anteriorly near inner margin of each depression; lateral margin insinuated near midlength; apex widely rounded, not reaching posterolateral angles of corium. Disc strongly convex, often forming a hump (Figs. 64-66, 71-75), regularly declivous towards margins, apex in some species flat; median longitudinal ridge developed or absent.

Hemelytra. Clavus narrow, with 3-5 more or less regular rows of punctures in the widest place (e.g., Fig. 69), strongly narrowing posteriorly (with only one row of punctures), reaching insinuation near midlength of scutellum. Sides of corium nearly parallel basally, slightly divergent more apically; corium widest approximately in anterior third and then arcuately narrowed posteriorly (Figs. 29-34); posterolateral corial angle widely rounded, slightly surpassing apex of scutellum. Membrane translucent, widely rounded posteriorly, almost reaching apex of abdomen.

Thorax with venter convex to rather flattened; sternum between coxae shallowly to deeply furrowed (Figs. 68, 83). Ostiole of metathoracic scent gland shifted laterad, situated slightly interior of half-width (0.42-0.47) of metapleuron (Figs. 15-18, 24-25), issuing on small to large tubercle, round, orthogonal and directed laterad (Fig. 19, 23) to oblique and directed ventrolaterad (Figs. 20-22), accompanied with one small to very small auricle (Figs. 19-23). Evaporatorium developed both on meso- and metapleuron, on mesopleuron large (*T. stysi* sp. nov., Fig. 25) or small, present only as narrow strip on posterior margin along thoracic spiracle and slightly wider in posterolateral angle of mesopleuron (Figs. 16-17, 24); metapleural evaporatorium surrounding the tubercle bearing ostiole and projecting as narrow strip mesad between meso- and metacoxae, and laterad on anterior margin of metapleuron along thoracic spiracle; gyrfication developed. Posterior margin of mesopleuron and anterior margin of metapleuron depressed along thoracic spiracle and further laterad (including the posterolateral angle of mesopleuron), bearing evaporative microsculpture and forming thus an 'outlet channel' leading up to lateral margin of thorax. Posterolateral angle of metapleuron separated by deep and wide furrow.

Legs. Femora stouter and distinctly longer than tibiae (Figs. 68, 83), oval in cross-section;

profemora stoutest, spindle-shaped, narrowing towards base and apex; meso- and metafemora slightly widening towards apex, widest subapically. Tibiae with outer surface flattened; protibiae stoutest, metatibiae most slender. Tarsomere 2 shortest, tarsomere 3 longest, about as long as tarsomeres 1 and 2 together.

Abdomen slightly wider to slightly narrower than pronotum across humeral angles. Abdominal dorsum with distinct pair of guttiform scars of ostioles of anterior dorso-abdominal scent gland between tergites III and IV (Fig. 28; examined in females of *T. dubius*). Connexivum wide, fully exposed dorsally; outer margin of laterotergites very slightly to distinctly sinuate (Figs. 29-34). Abdominal venter slightly convex, medially nearly flat, slightly concave near margin; ventrite III not depressed medially (except for *T. stysi* sp. nov.) (Figs. 68, 83); spiracle on ventrite II covered by metapleuron.

Male genitalia. Pygophore small (ratio of pygophore width to body length equal to 0.13-0.19), in ventral view, trapezoidal with lateral margins slightly arcuate (Figs. 36, 38, 40, 43, 46); ventral wall large and gibbose; ventral rim well developed (Fig. 36) or obscured, then merging with ventral rim infolding (Fig. 38); ventral rim infolding usually bent upwards, medially shallowly concave to deeply incised, laterally produced into triangular projections (e.g., Figs. 38, 42, 45); cup-like sclerite well developed; dorsal wall narrow, dorsal rim hardly developed; dorsal and lateral rim infoldings well developed; genital chamber opening directed posterodorsally; paramere sockets shallow (Figs. 42, 45); apical parts of parameres usually visible (not in *T. stysi* sp. nov.); posterolateral angles ear-like, rounded, only slightly surpassing ventral rim posteriorly. Paramere simple, laterally flattened, L- to crescent-shaped (Figs. 47-51). Phallosome of aedeagus nearly parallel-sided (Figs. 55-56) to oval (Fig. 53), widely opened dorsally, without processes; vesica tubular, narrow, usually accompanied with sclerotized apical processes of median penial plates (indistinct in *T. kerzhneri* sp. nov.) (e.g., Fig. 52).

Female genitalia. External female genitalia (Figs. 57-59) with gonocoxites 8 nearly touching medially or widely apart, with posterior margin slightly concave and sutural margin slightly convex; gonapophyses 8 visible; posterior margin of laterotergites 9 narrowly rounded. Internal female genitalia examined only in *T. dubius* (see Figs. 60-63). Apical receptacle of spermatheca generally spherical, pigmented, lacking basal neck-like duct, apically with bunch of several curved and branched processes of variable shape (Figs. 61-63); intermediate part with both distal and proximal flange well developed, desclerotized and non-pigmented flexible zone situated near distal flange; spermathecal duct with short distal part, followed by large and elongated dilatation, about twice as long as apical receptacle and intermediate part together (Fig. 60); proximal part of spermathecal duct longer than distal part. Ring sclerites (= chitinellipsen) of parietovaginal glands present, rather small, guttiform, laterally rounded, medially pointed; anterior thickenings of vaginal intima forming V-shaped structure (Fig. 57, 60).

Differential diagnosis. The genus *Triplatyx* is easily distinguished from both *Anoano* and *Tricompastes* by the characters given in the key (see above).

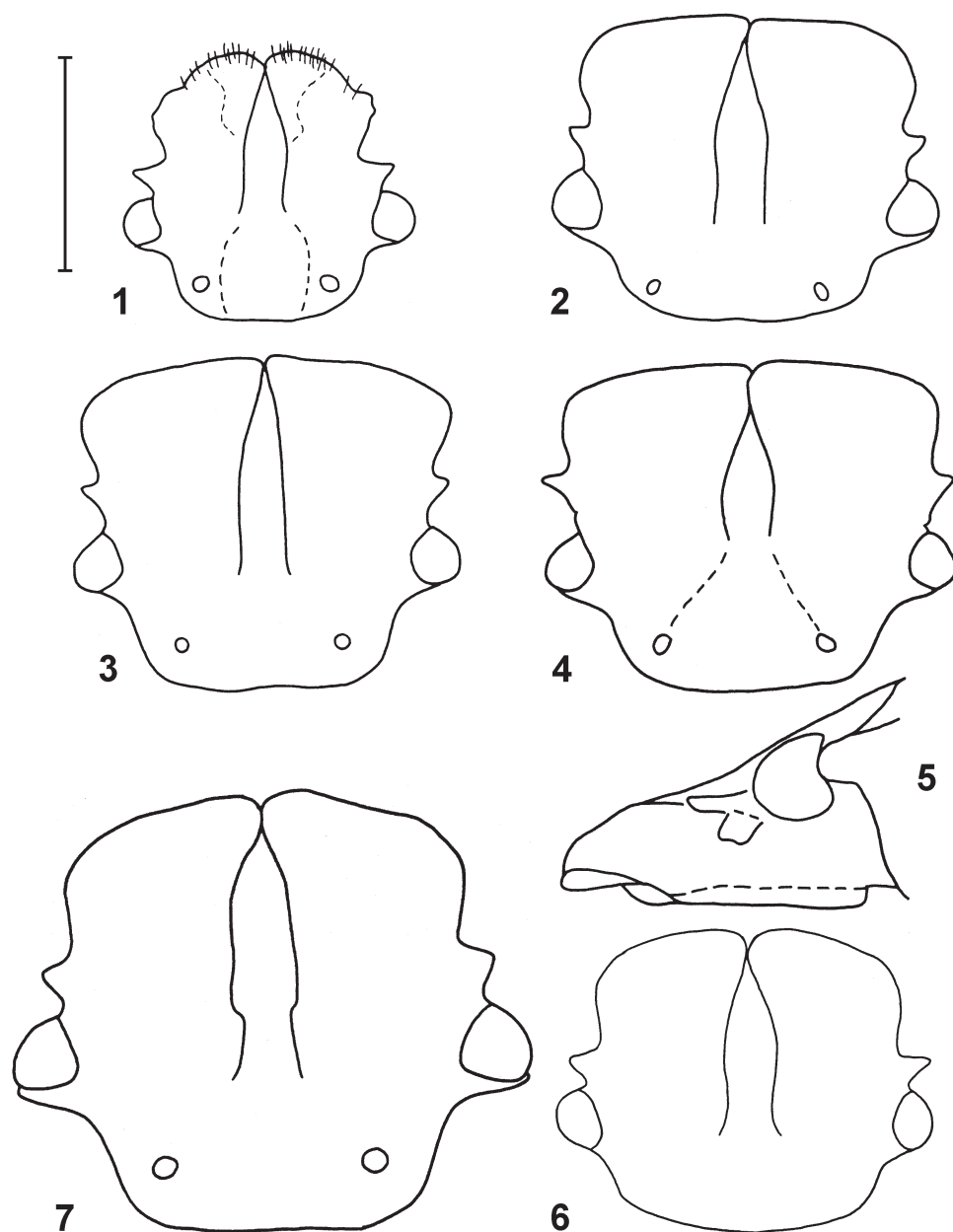
Etymology. HORVÁTH (1904) established this generic name without any information concerning its etymology and gender. JENSEN-HAARUP (1931) combined *Triplatyx* with species epithet *dubius*, considering thus *Triplatyx* as masculine.

Distribution. Madagascar (Fig. 86).

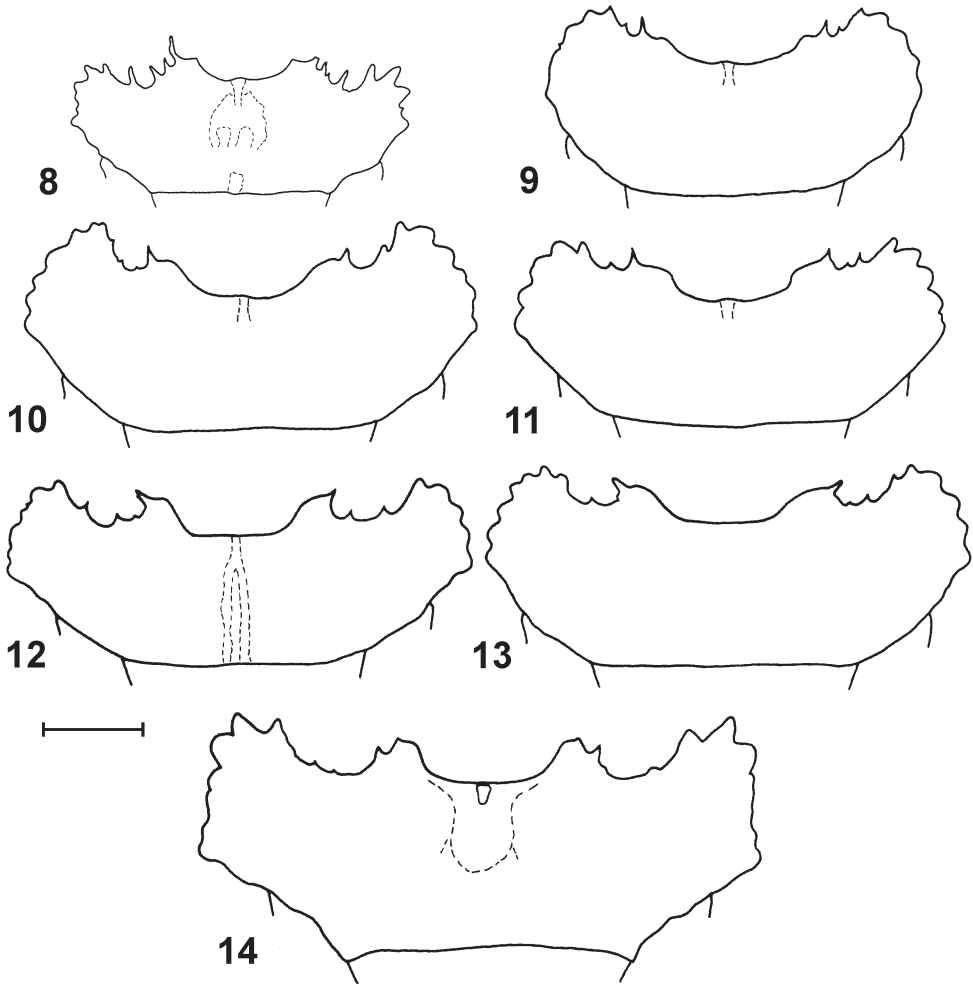
***Triplatyx bilobatus* Cachan, 1952**

(Figs. 1, 8, 15, 19, 29, 35-36, 47, 53a-b, 67-71, 84, 86)

Triplatyx bilobatus Cachan, 1952: 374-376. Description, key.**Type locality.** Madagascar, Androy region, Ambovombe [25°11'N, 46°03'E].**Type material examined.** HOLOTYPE: ♂, 'MUSEUM PARIS / MADAGASCAR / RÉGION DE L'ANDROY / AMBOVOMBE / D'J. DECORSE 1901 [p, white label] // fêv. & mars [p, white label] / 1901 // TYPE [p, red label] // *Triplatyx / bilobatus / n. sp. / Cachan det. [hw, white label]*' (MNHN). The holotype (Figs. 69-70) is pinned through the scutellum by a micro-pin pushed into a piece of card; pygophore missing.**Additional material examined. MADAGASCAR:** Isalo National Park, Amboandrika forest, 19.i.2007, 1 ♂, Z. Mráček lgt. (NMPC).**Redescription. Adult** (Figs. 67-71). **Colouration.** Body generally dark brown to black, with smaller or larger ivory callosities scattered on both dorsal and ventral surfaces. Eyes pale brown. Lateral spines on anteromedian angles of pronotum whitish. Antennomere 1 dark brown; antennomeres 2 and 3 beige, antennomere 3 slightly darkened apically; antennomere 4 brownish and antennomere 5 dark brown, both with paler bases. Fore coxae, apical thirds of femora, and entire tibiae whitish (Fig. 68); tibiae with three more or less regular brownish rings; very apices of tibiae and entire tarsi pale brown; apices of claws black. Each laterotergite with medial whitish spot in outer half both on dorsal and ventral sides.**Sculpture.** Dorsal surface deeply and very densely punctate; punctures dark brown to black; interspaces among punctures smaller than their diameters, with scattered small callosities which are very small on head, connexivum and most of anterior part of pronotum and scutellum. Anterior part of pronotum medially with large callosities forming elevated triangular ridge, widening posteriorly and reaching midlength of pronotum (Figs. 67, 70); posterior part of pronotum with several small callosities, one of them in middle of posterior margin. Scutellum with basal angles shallowly depressed, with globular callose grain present anteriorly near inner margin of each depression; several larger callosities in posterior third of scutellum. Hemelytra with scattered large callosities, widely coalescent in posteromedian part of corium. Femora and tibiae with distinct concolorous punctures. Ventral surface of body with dense deep punctures and very few callosities, only abdominal venter medially with large, not elevated, coalescent callosities and sparse punctures (Fig. 68).**Structure. Head** only slightly declivous, nearly quadrangular in outline (Fig. 1). Lateral margin in front of eyes with narrowly triangular anteocular spine, deeply incised; paraclypei flattened but little expanded laterally, narrowing anteriorly in front of lateral incision, straight, then rounded mesad anteriorly, meeting in front of clypeus and forming there distinct incision; paraclypei and clypeus anteriorly depressed; anterior margin of paraclypei both dorsally and ventrally with erect pale setae. Clypeus and frons usually only slightly convex. Antennomeres ordered from shortest to longest as $1 < 3 < 2 < 4 < 5$, antennomere 2 distinctly longer than each of antennomeres 1 and 3. Bucculae both anteriorly and posteriorly nearly rectangular, their lower margin straight. Apex of rostrum reaching anterior margins of metacoxae (Fig. 68).**Pronotum** (Figs. 8, 70). Anterolateral angles truncated, laterally with long, slender spine curved towards eye. Anterolateral margins concave, not carinate, with three slender spines on each side. Humeral angles slightly produced anteriorly and dorsad, separated from pronotal disc by shallow depression, each bearing 4-6 spine-like to lobe-like projections. Margins behind humeral angles nearly straight, narrowing towards scutellum. Posterior margin slightly



Figs. 1-7. Head (1-4, 6-7 – dorsal view, 5 – lateral view). 1 – *Triplatyx bilobatus* Cachan, 1952 (♂, Isalo NP); 2 – *T. dubius* Jensen-Haarup, 1931 (♂, Ankarafantsika forest); 3 – *T. kerzhneri* sp. nov. (♂, holotype, Maromandia); 4-6 – *T. quadriceps* Horváth, 1904 (4-5 – ♂, lectotype, Antongil Bay; 6 – larva, Périnet); 7 – *T. stysi* sp. nov. (♂, holotype, Ranomafana NP). Scale bar = 1 mm.



Figs. 8-14. Pronotum. 8 – *Triplatyx bilobatus* Cachan, 1952 (♂, Isalo NP); 9-11 – *T. dubius* Jensen-Haarup, 1931 (9 – ♀, Anjahantelo; 10 – ♂, Ankarafantsika forest; 11 – ♂, 'Madag'); 12 – *T. kerzhneri* sp. nov. (♂, holotype, Maromandia); 13 – *T. quadriceps* Horváth, 1904 (♂, lectotype, Antongil Bay); 14 – *T. stysi* sp. nov. (♂, holotype, Ranomafana NP). Scale bar = 1 mm.

concave. Disc in anterior part flat, declivous anteriorly, uneven, with distinct triangular elevation medially, and one less conspicuous oval submedian elevation on each side; median and submedian elevations separated by deep and narrow furrow reaching nearly anterior margin of pronotum, then turning laterad and nearly reaching anterolateral angles; submedian elevations laterally and posteriorly emarginated by shallow depressions. Posterior part of pronotum distinctly convex, separated from scutellum by V-shaped furrow (Fig. 71).

Scutellum. Basal angles narrowly depressed. Disc strongly elevated in anterior half, forming conical, apically rounded hump, distinctly detached from pronotum (Fig. 71), posterior third nearly flat; median longitudinal ridge not developed.

Hemelytra. Clavus with three irregular rows of punctures in widest place; apex of membrane not surpassing apex of abdomen (Figs. 67, 69).

Thorax ventrally convex (most of all *Triplatyx* species); sternum between coxae shallowly furrowed (Fig. 68). Ostiole situated on rather large tubercle, round, transverse and directed laterad (Fig. 19), accompanied with small auricle (Figs. 19), approximately twice longer than ostiole wide, metapleuron around ostiole distinctly depressed. Evaporatorium large, developed both on meso- and metapleuron, present as narrow but distinct strip along posterior margin reaching posterolateral angle on mesopleuron (Fig. 15) and rather widely surrounding the tubercle bearing ostiole on metapleuron where projecting as narrow strip mesad between meso- and metacoxae, and laterad on anterior margin of metapleuron along thoracic spiracle. Posterior margin of posterolateral angle of mesopleuron slightly depressed, forming an 'outlet channel'; channel less deep and conspicuous than in remaining species; gyrfication well developed.

Legs. Protibiae distinctly widening towards apex (Fig. 70), outer surface strongly flattened, lateral margin forming sharp ridge.

Abdomen slightly narrower than pronotum across humeral angles. Sternite III not depressed anteromedially. Laterotergites and lateral margins of mediotergites exposed dorsally; outer margins of laterotergites strongly sinuate, each laterotergite bilobate with one anterior and one posterior lobe (Figs. 29, 67, 69); dorsal surface of laterotergites uneven, lateral margin depressed in outer half near midlength.

Male genitalia. Pygophore (Figs. 35-36) relatively large (pygophore width 0.90 mm, ratio pygophore width to body length 0.19); ventral wall slightly gibbose, ventral rim well developed, low but sharp, ventral rim infolding wide, bent dorsally, shallowly U-shaped medially, lateral projection obtusangulate (Fig. 36); posterolateral angles widely rounded laterally; lateral rim infolding without projection; apices of parameres visible, directed dorsad. Paramere simple, laterally flattened, apical portion basally curved, apically widely rounded (Fig. 47); apex of paramere, in dorsal view, slightly widened and flattened. Phallosome of aedeagus oval, sclerotized apical processes of median penial plates well developed (Fig. 53).

Female. Unknown.

Measurements (all in mm). See Table 1. The holotype (♂): body length 5.1; head: length 1.4, width 1.45, interocular width 1.0; length of antennomeres: 1 – 0.25, 2 – 0.4, 3 – 0.33, 4 – 0.43, 5 – 0.6; pronotum: length 1.25, width 3.85; scutellum: length 2.0, width 1.9.

Variation. Both specimens differ in the shades of body colouration (callosities on pronotum reddish in holotype (Fig. 70), ivory in the other male (Fig. 67)), the shape of paraclypei (convex in holotype, slightly incised in the other male), and the shapes of humeral angles and spines on anterolateral margin of pronotum.

Differential diagnosis. Smallest species of the genus, dark to blackish brown, easy to be identified by the following combination of characters: head nearly quadrangular, deeply insinuated in front of anteocular spine, paraclypei arcuate laterally and anteriorly, leaving wide triangular incision against tip of clypeus; anterior margin of head setose; bucculae anteriorly

straight, rectangular; pronotum uneven, bearing large triangular pale elevation in anterior part; anterolateral angles of pronotum spinose, not carinate; posterior part of pronotum and anterior part of scutellum, in lateral view, forming sharp angle; scutellum with high, conical hump in its anterior half, lacking longitudinal ridge; legs punctate, protibiae widening towards apex; lateral margin of connexivum strongly sinuate; and details of male genitalia.

Collecting notes. The specimen from Isalo National Park was collected in the Amboandrika forest (Fig. 84) by beating lower parts of tree branches (M. Trýzna, pers. comm.). Both known specimens were collected between January and March. *Triplatyx bilobatus* was collected together with *T. dubius* at the locality of Ambovombe.

Distribution. So far known only from two localities in southern Madagascar (Fig. 86).

Triplatyx dubius Jensen-Haarup, 1931

(Figs. 2, 9-11, 16, 20, 28, 30-31, 41-43, 48, 52a-c, 57, 60-66, 72, 76-78, 86)

Triplatyx dubius Jensen-Haarup, 1931: 222. Description.

Triplatyx dubius: CACHAN (1952): 374-375, pl. XI. Redescription, key, figures.

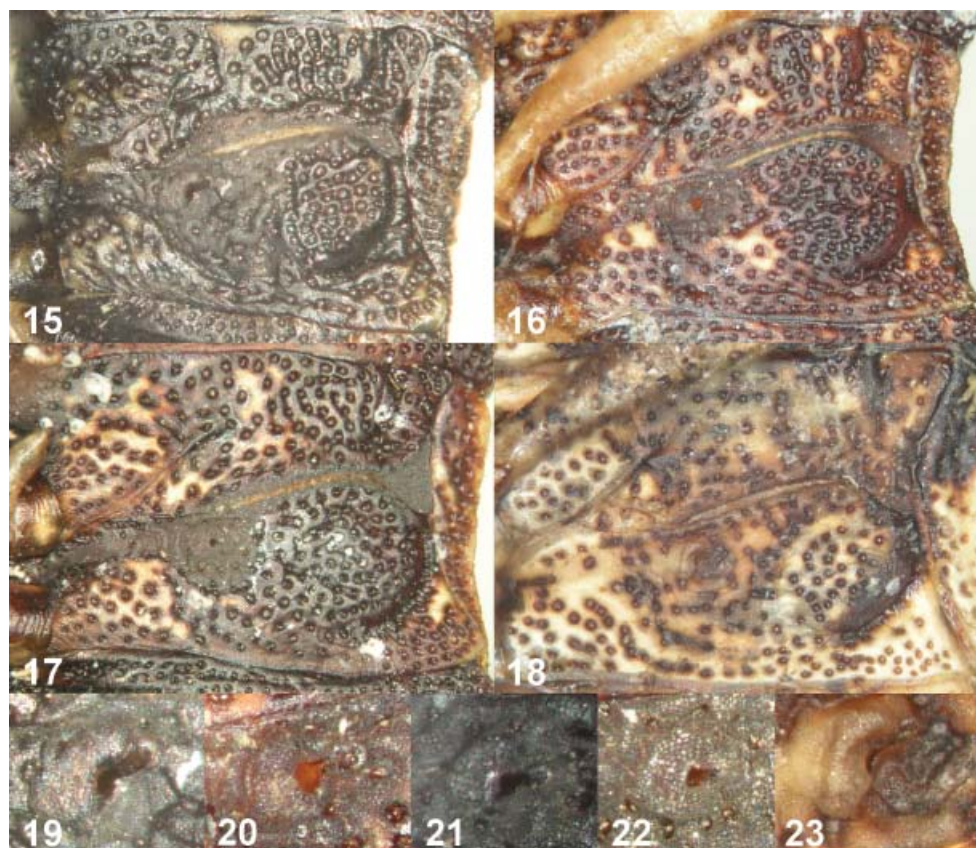
Triplatyx dubius: WEIDNER (1972): 124. List of types.

Type locality. Madagascar.

Type material examined. HOLOTYPE: ♀, 'Type [p, pink label] // Madagaskar. / F. Sikora // vend. 20.III.1896. [p, white label] // ♀ / Type / Coll. J=Hrp. [p, white label] // *Triplatyx / dubius* J. Hrp. / Det. [hw] Jensen-Haarup [p, white label] // A.C.Jensen-Haarup / determ. 1928 [p, white label]' (ZMUH). The holotype (Figs. 77-78) is pinned, poorly sclerotized and shrunken (especially scutellum, hemelytra and abdomen), pale brown.

Additional material examined. MADAGASCAR: Madag[ascar], 1 ♂ (NMPC); Madagascar, 1900, 1 ♀, Fairmaire lgt. (MNHN); Madagascar, 1930, 1 ♀, coll. Sicard, P. Cachan det. as *Triplatyx quadraticeps* (MNHN); (C): Tananarive [= Antananarivo], 1 ♀, Clermont Vend. [?lgt.], W. E. China 1929 det. as *Triplatyx quadraticeps* (ZMAS); (NW): det. Majunga [= Mahajanga province], [Ampijoroa National Park], forêt [= forest] Ankarafantsika, 120 m a.s.l., xii.1959, 1 ♂, Raharizonina [?lgt.], Institute Scientifique Madagascar (MNHN); Ankarafantsika prot[ected] area, 10.xii.2001, 1 ♂, Dolin lgt. (EHIA); Mahajanga province, Mahajamba river, Ampatika env., 10.-12.xii.1996, 1 ♀, I. Jeniš lgt. (ZJPC); (S): Anjahantelo près [= near] Amboasary, iii.1963, 3 ♀♀, Vadon & Peyrieras lgt. (MNHN, NMPC); Androy region, Ambovombe, ii.-iii.1901, 1 spec. (abdomen lost), J. Decorse lgt., P. Cachan det. as *Triplatyx dubius* (MNHN); Pays [= region of] Androy, Ambovombé, xi.1901, 1 ♀, Ch. Alluaud lgt. (MNHN); Ivahona env., 23 km SE of Betroka, 850 m a.s.l., I.i.1999, 1 ♀, P. Bulirsch lgt. (ZJPC); (SW): Sakaraha [env.], Lambomakandro, 2 ♀♀, P. Griveaud lgt., Institute Scientifique Madagascar (BMNH, MNHN); réserve spéciale du Zombitsy [= Zombitsy National Park], est de [= E of] Sakaraha, matsabory [= marsh], 640 m a.s.l., 7.-10.xi.1974, 1 ♀, P. Viette & Peyrieras A. lgt. (MNHN); Lambomakandro, Tuléar [= Toliara province], 1935, 2 ♂ 1 ♀, R. Cataia [lgt.] (MNHN); 55 km de Tuléar [= Toleara], Rte vers Tananarive [= road to Antananarivo], iii.[19]57, 1 ♂ 1 ♀, R. J. E. [?lgt.], Institute Scientifique Madagascar (BMNH, MNHN); (W): det. Antsalova, Andobo, forêt [= forest] Autsiasy, [Tsingy de Bemaraha Strict Nature Reserve], xi.[19]57, 1 ♀, P. Griv[eaud] lgt., G. M. Day 1964 det. as *Triplatyx dubius* (MNHN); Morondava, forêt sud du [= forest south of] Befasy, i.[19]56, 1 ♂ 3 ♀♀, R. P. [?lgt.], Institute Scientifique Madagascar, G. M. Day 1964 det. as *Triplatyx dubius* (partim) (BMNH, MNHN).

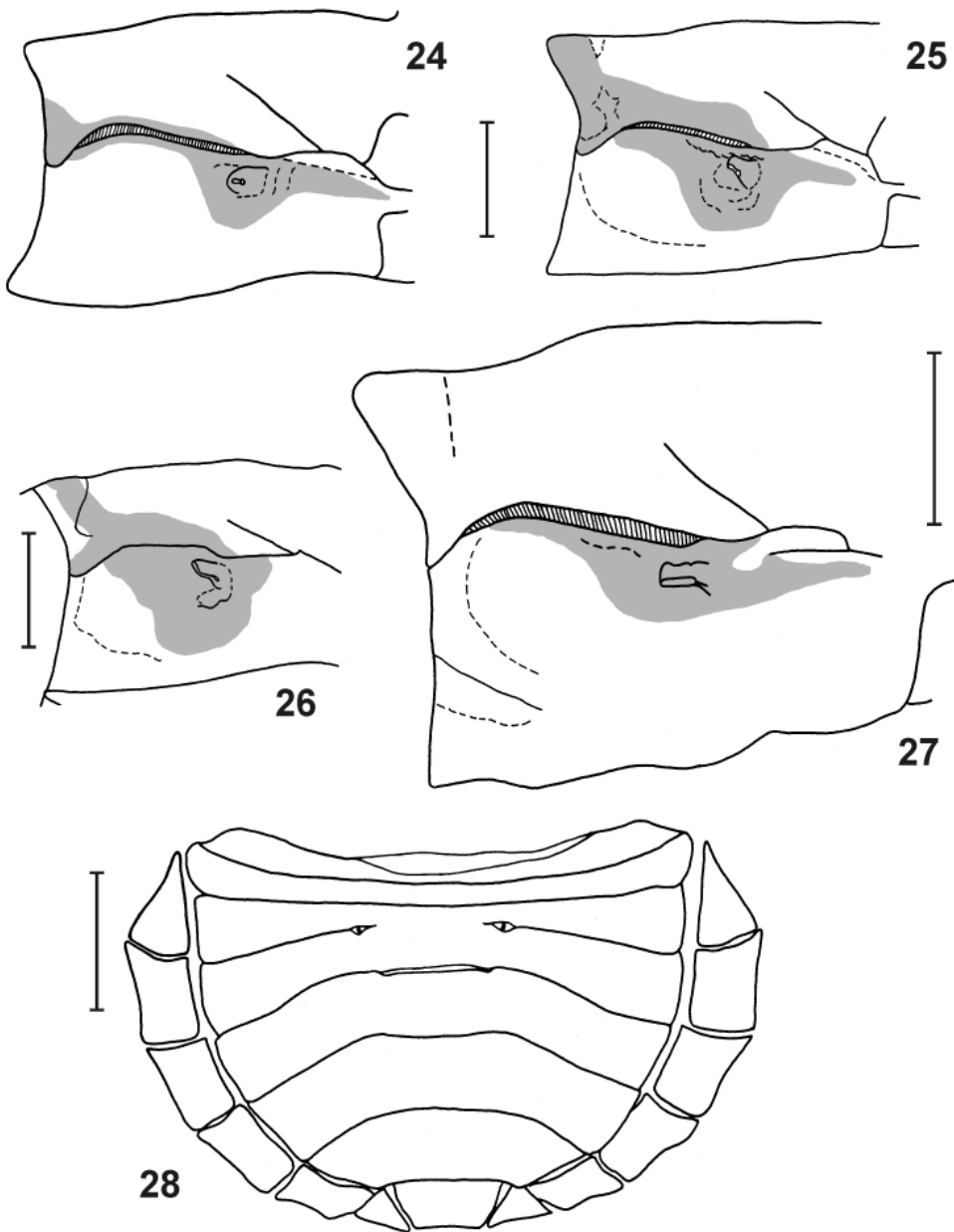
Redescription. Adult (Figs. 72, 76-78). **Colouration.** Body dorsally pale to dark brown, pronotum and scutellum with more or less distinct (often completely absent) pale, callose longitudinal midline. Antennae entirely pale brown, or basal half of antennomere 1, apical half of antennomere 4 and apical two-thirds of antennomere 5 all brown to dark brown. Eyes pale to dark brown, usually with silver or gold luster. Laterotergites each medially with small, narrow pale spot at margin. Ventrums of body dark to blackish brown; abdomen medially with large yellowish callosities. Rostrum brownish, apically dark brown. Legs pale brown with irregular brown spots; claws in apical halves black. Abdominal spiracles black.



Figs. 15-23. 15-18 – meso- and metapleuron (magnification 63×); 19-23 – metathoracic scent gland auricle (90×). 15, 19 – *Triplatyx bilobatus* Cachan, 1952 (♂, Isalo NP); 16, 20 – *T. dubius* Jensen-Haarup, 1931 (♂, Lambomakandro); 21 – *T. kerzhneri* sp. nov. (♂, holotype, Maromandia); 17, 22 – *T. quadriceps* Horváth, 1904 (♂, lectotype, Antongil Bay); 18, 23 – *T. stysi* sp. nov. (♀, paratype, Moramanga). Photo: P. Kment.

Sculpture. Body dorsally densely to very densely punctate. Interspaces among punctures narrower than or as wide as their diameters; if wider, than forming irregular, pale, convex callosities; punctures concolorous to black, usually dark brown. Callosities on dorsum very variable: in some specimens absent; in others, sparse, scattered, small and irregular (especially on connexiva) or forming more or less complete simple or double longitudinal midline on pronotum and scutellum. Basal angles of scutellum with small, raised, globular, ivory to beige callose grain. Venter of body very densely punctate, punctures on thorax distinctly larger than those on head and abdomen, abdomen medially with much sparser punctation than on sides; sides of thorax and abdomen with few to many small or larger irregular beige callosities (Fig. 16). Legs without distinct punctures.

Structure. **Head** strongly declivous, nearly trapezoid in outline (Fig. 2). Lateral margins in front of eyes with triangular anteocular spine, more anteriorly slightly but distinctly incised;



Figs. 24-28. 24-27 – meso- and metapleuron. 24 – *Triplatyx quadraticeps* Horváth, 1904 (♂, lectotype, Antongil Bay); 25 – *T. stysi* sp. nov. (♀, paratype, Moramanga); 26 – *Anoano pronotalis* Cachan, 1952 (♂, syntype, Ambovombe, MNHN); 27 – *Tricompastes gigas* Cachan, 1952 (♀, no locality, MNHN). 28 – abdominal dorsum of *T. dubius* Jensen-Haarup, 1931 (♀, Madagascar, Fairmaire). Scale bars = 1 mm; evaporatorium grey.

paraclypei foliaceous, flattened, long and wide, widening laterad in front of lateral incision and rounded mesad anteriorly, more or less regularly arcuate; anterior margin of head nearly straight to slightly convex; paraclypei meeting in front of clypeus, forming only small incision; paraclypei slightly depressed medially or flat, with anterior margin both dorsally and ventrally lacking setae. Clypeus and frons slightly convex to nearly flat. Antennomeres ordered from shortest to longest as $3 \leq 1 \leq 2 \leq 4 < 5$. Bucculae regularly narrowing anteriorad and evanescent in front, slightly narrowing posteriorad and apically rounded, with lower margin slightly insinuated medially. Apex of rostrum reaching anterior margins of metacoxae or lying between them.

Pronotum (Figs. 9-11, 78). Anterolateral angles truncated, wide, weakly protruding anteriorly, laterally with distinct spine. Anterolateral margins nearly merging with humeral angles and very variable in shape: concave to nearly straight, carinate, inerme or bearing one minute to large triangular spine medially or one large and one minute spine. Humeral angles very wide, slightly to distinctly produced anteriorad, slightly declivous, widely rounded, anteriorly and laterally bearing 4-6 well developed to hardly distinct triangular or lobe-like projections; the most anterior projection usually best developed, the most posterior one sometimes protruding of arcuate outline; in some specimens, projections poorly developed and humeral angles laterally only weakly sinuate. Margins of pronotum behind humeral angles regularly rounded, narrowing towards scutellum; posterior margin slightly concave. Pronotal disc anteriorly and medially slightly convex, strongly declivous towards head, without distinct median elevation; dorsal surface of humeral angles continuous with rest of pronotum, only slightly concave basally; posterior part of pronotum distinctly convex sublaterally, slightly convex medially, confluent with anterior surface of scutellum.

Scutellum. Basal angles shallowly depressed; disc slightly and regularly elevated, not forming a hump (Figs. 64, 72), to distinctly elevated, forming low to moderately high, round hump (Figs. 65-66), convex in anterior two-thirds of scutellum and continuous with surface of pronotum; lateral surfaces flattened in midlength of scutellum; posterior surface narrowly rounded, regularly declining towards apex, lacking any elevation; scutellar apex nearly flat.

Hemelytra. Clavus with 3-4 irregular rows of punctures in widest place; apex of membrane almost reaching apex of abdomen.

Thorax ventrally flattened; sternum between coxae shallowly furrowed. Ostiole situated on small tubercle, round, directed obliquely ventrolaterad (Figs. 16, 20) and accompanied with small auricle (Fig. 19); auricle less than twice longer than ostiole wide; metapleuron around ostiole hardly depressed. Evaporatorium small, developed both on meso- and metapleuron; on mesopleuron forming only narrow strip along posterior margin and widened in its depressed posterolateral angle (Fig. 16); evaporatorium on metapleuron narrowly surrounding tubercle bearing ostiole and projecting as narrow strip mesad between meso- and metacoxae, and laterad on anterior margin of metapleuron along thoracic spiracle and further laterad; 'outlet channel' well developed (Fig. 16); gyrification poorly developed.

Legs. Protibiae hardly widening towards apex, their outer surface distinctly flattened, lateral margins carinated.

Abdomen slightly narrower to slightly wider than pronotum across humeral angles; sternite III not depressed anteromedially. Laterotergites fully exposed dorsally, mediotergites completely covered with hemelytra; laterotergite III laterally distinctly bisinuate, with more

or less protruding projection medially; laterotergites IV-VI laterally slightly bisinuate to nearly straight, laterotergites VII-VIII laterally nearly straight (Figs. 30-31); dorsal surface of laterotergites nearly flat, sometimes with shallow depressions medially.

Male genitalia. Pygophore (Figs. 41-43) relatively small (pygophore width 0.70-0.78 mm, ratio pygophore width to body length 0.13-0.14; $n = 4$); ventral wall gibbose; ventral rim medially not developed, laterally indicated by shallow ridges on posterolateral angles; ventral wall continually merging into ventral rim infolding, neither of them deeply depressed subapically at base of posterolateral angles; ventral rim infolding bent dorsally, shallowly concave medially, lateral projection obtusangulate (Fig. 42); posterolateral angles narrowly rounded laterally, lateral rim of posterolateral angles wider; lateral rim infolding dorsally with semi-circular projection (Fig. 42, red arrow); paramere sockets distinct; apices of parameres visible, directed obliquely dorsolaterally. Paramere simple, laterally flattened, apical portion slightly longer than basal portion, medially curved, apically widely rounded (Fig. 48); apex of paramere in dorsal view neither widened, nor flattened. Phallosome of aedeagus slightly oval, sclerotized apical processes of median penial plates narrow, well developed (Fig. 52).

Female genitalia (Fig. 57). Gonocoxites 8 with posterior margin slightly concave and sutural margin slightly convex, both gonocoxites 8 almost in contact medially; gonapophyses 9 visible; posterior margin of laterotergites 9 narrowly rounded. For description of internal female genitalia (Figs. 60-63) see generic redescription.

Measurements. See Table 1. JENSEN-HAARUP (1931) indicated the body length of the holotype as 4.5 mm. Females are larger than males: ♂♂ 5.0-5.4 mm, ♀♀ 5.4-6.0 mm.

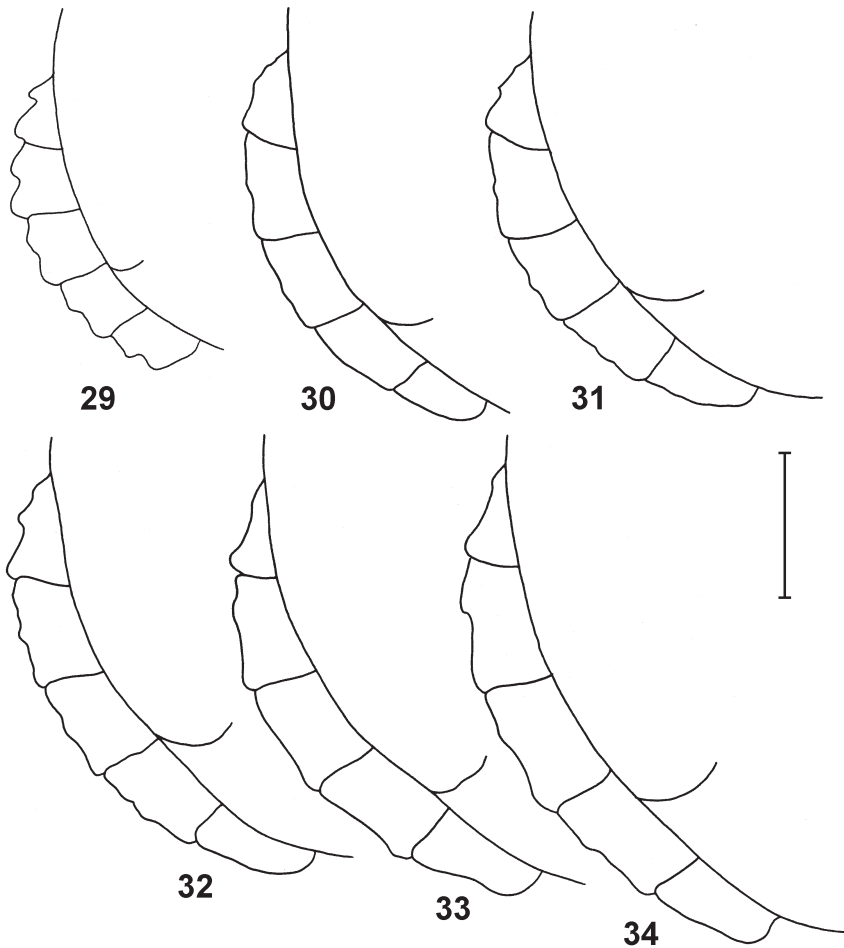
Variation. Extremely variable in external characters, especially in the colouration of body, the density and colouration of punctures, the presence and distribution of callosities (e.g., the presence of the pale median callose line on pronotum and scutellum), the shape of head, pronotum (Figs. 9-11), scutellum (a hump developed or not; Figs. 64-66, 72), and connexivum (Figs. 30-31). The holotype has no hump on scutellum and pronotum evenly rounded laterally (Figs. 77-78), humeral angles not much produced anteriorly, not reaching the line of anteocular spines. Apical receptacle of spermatheca with bunch of very variably shaped processes (Figs. 61-63).

Differential diagnosis. *Triplatyx dubius* is habitually very similar to *T. quadriceps* and *T. kerzhneri* sp. nov. All three species share the following characters: head trapezoid in outline; humeral angles of pronotum more or less rounded; thorax ventrally flattened; auricle of metathoracic scent gland very small, directed obliquely ventrolaterad; metapleuron around ostiole hardly depressed; evaporatoria small with well developed 'outlet channel'; protibiae not widening towards apex; legs without distinct punctures; outer margin of laterotergites only slightly bisinuate to nearly straight. The three species can be distinguished with certainty only according to genitalic characters. *Triplatyx dubius* is characterized by the posterolateral angles of pygophore laterally rounded (Figs. 41-42); the ventral wall of pygophore continually merging into ventral rim infolding, neither of them being deeply depressed subapically at base of posterolateral angles; the lateral rim of posterolateral angles wide; the lateral rim infolding dorsally with semi-circular projection (Fig. 42, red arrow); the paramere as in Fig. 48. Moreover, *T. dubius* usually lacks the scutellar hump, has a slightly larger auricle (less than twice longer than ostiole wide) (Fig. 20), the pale median callose line on pronotum and scutellum is usually absent, and the humeral angles of pronotum are less prominent. However,

specimens with developed hump and/or large humeral angles may be difficult to identify.

Collecting notes. According to the locality labels, *T. dubius* was collected at least three-times in forests (Ankarafantsika, Autsiasy, Befasy); one label quotes the word ‘matsaborý’, meaning marsh in Malagasy. The localities with known altitude are situated between 120 and 850 m a.s.l. All the specimens examined were collected during the summer period from November to March. In Ambovombe, *T. dubius* was collected sympatrically with *T. bilobatus*.

Distribution. Widely distributed in north-western, western, central, and southern Madagascar (Fig. 86). All localities (except those on southern coast) are situated in drainage areas of rivers



Figs. 29-34. Connexivum. 29 – *Triplatyx bilobatus* Cachan, 1952 (♂, Isalo NP); 30-31 – *T. dubius* Jensen-Haarup, 1931 (30 – ♀, Anjahantelo; 31 – ♂, Ankarafantsika forest); 32 – *T. quadriceps* Horváth, 1904 (♂, lectotype, Antongil Bay); 33-34 – *T. styisi* sp. nov. (33 – ♂, holotype, Ranomafana NP; 34 – ♀, paratype, Moramanga). Scale bar = 1 mm.

flowing westwards to the Mozambique Channel; *T. dubius* has not been collected on the east side of the island characterized by humid forests.

***Triplatyx kerzhneri* sp. nov.**

(Figs. 3, 12, 21, 37-38, 49, 54, 73, 79, 86)

Type locality. Madagascar, Analalava region, Maromandia [14°12'S, 48°05'E].

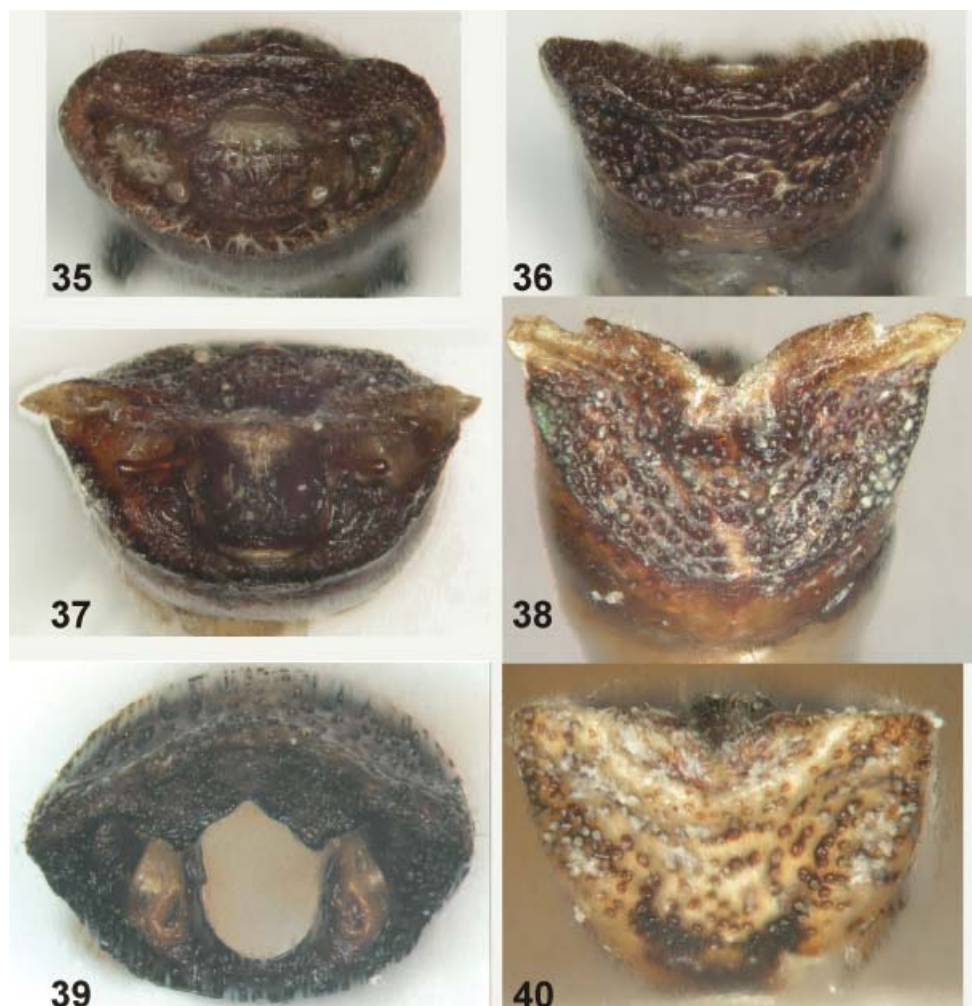
Type material examined. HOLOTYPE: ♂, 'MUSEUM PARIS / MADAGASCAR / PROV D'ANALALAVA / MAROMANDIA / R. DECARY 192[p]3[hw] [blue-grey label] // ♂ [p, white label] // HOLOTYPE / TRIPLATYX / KERZHNERI / sp. nov. / det. P. KMENT 2008 [p, red label]'. The holotype (Figs. 75, 79) is pinned through scutellum; dissected pygophore, one paramere and proctiger are mounted on white card, and phallus is mounted on translucent card; both cards are attached to the same pin as the specimen.

Description. Adult (Figs. 75, 79). **Colouration.** Body dorsally dark brown; head posteriorly, pronotum and scutellum with narrow pale callose midline; anterolateral margins of pronotum narrowly pale brown. Antennomeres pale brown, only antennomere 1 basally and antennomere 5 in apical two-thirds dark brown. Eyes reddish brown. Laterotergites each with small, narrow pale spot medially at their very margin. Venter of body dark to blackish brown. Rostrum brownish, apically dark brown. Legs pale brown with irregular dark brown spots; claws in apical halves black. Abdominal spiracles black.

Sculpture. Body dorsally densely punctate; interspaces among punctures narrower than or as wide as their diameters; if wider, than forming irregular, convex callosities (Fig. 79); punctures dark brown to black. Callosities usually very small, brown, inconspicuous; head from base of clypeus to posterior margin with simple narrow callose midline; on pronotum, callose midline split behind anterior margin into two parallel narrow lines continued on posterior part of pronotum and scutellum (Figs. 12, 79). Basal angles of scutellum with small, elevated, globular beige callose grain. Ventral surface of body very densely punctate; thorax and abdomen laterally with scattered, small, irregular, pale brown callosities; abdomen medially with sparse punctures and large, yellowish, flat callosities. Legs without distinct punctures.

Structure. Head strongly declivous, nearly trapezoid in outline (Fig. 3). Lateral margin in front of eyes with small triangular anteocular spine, more anteriorly straight, lacking distinct incision; paraclypei foliaceous, flattened, long and wide, with oblique margin, widening laterad and more anteriorly regularly arcuate mesad with anterior margin nearly straight, meeting in front of clypeus without apparent triangular incision, surface of paraclypei slightly depressed medially, anterior margin both dorsally and ventrally without setae. Clypeus and frons slightly convex. Antennomeres ordered from shortest to longest as $1 \leq 3 \leq 2 < 4 < 5$. Bucculae regularly narrowing anteriorly, evanescent, posteriorly slightly narrowed and rounded apically, lower margin slightly insinuated medially. Apex of rostrum reaching between metacoxae.

Pronotum (Fig. 12). Anterolateral angles truncated, laterally with distinct spine; anterolateral margins concave, carinate, bearing one short triangular spine medially and one additional short spine laterally near humeral angles. Humeral angles wide, distinctly produced anteriorly, slightly declivous, almost quadrangular (Fig. 12), anteriorly with one narrow lobe-like projection, laterally with 4-5 lobe-like projections; median projections very low, posterior projection angulate, markedly protruding from outer outline of pronotum. Margins behind humeral angles slightly convex, regularly narrowing towards scutellum. Posterior margin nearly straight, only slightly concave medially. Disc anteriorly and medially nearly flat, obliquely



Figs. 35-40. Pygophore (35, 37 – posterodorsal view, ventral rim above; 36, 38, 40 – ventral view; 39 – posterior view, dissected). 35-36 – *Triplatyx bilobatus* Cachan, 1952 (Isalo NP; width 0.90 mm); 37-38 – *T. kerzhneri* sp. nov. (holotype, Maromandia; width 1.05 mm); 39-40 – *T. stysi* sp. nov. (paratype, Ambodinifody env.; width 1.05 mm). Photo: J. Macek (35-38, 40) & P. Kment (39).

descending towards head, with low, short and wide median elevation close to anterior margin, accompanied with a shallow depression on each side. Humeral angles dorsally continuous with rest of pronotum, only slightly concave basally. Posterior part of pronotum distinctly convex sublaterally, flat medially, confluent with anterior surface of scutellum (Fig. 73).

Scutellum. Basal angles shallowly depressed; disc elevated, forming high, round hump (Fig. 73) on anterior two-thirds of scutellum; its anterior surface convex, continuous with surface of pronotum; lateral surfaces medially slightly concave, scutellum being slightly flattened



Figs. 41-46. Pygophore (41-42, 44-45 – posterdorsal view, ventral rim above; 42, 45 – dissected; 43, 46 – ventral view). 41-43 – *T. dubius* Jensen-Haarup, 1931 ('Madag'; width 0.78 mm); 44-46 – *T. quadriceps* Horváth, 1904 (paralectotype, Antongil Bay; width 0.88 mm). Photo: J. Macek (41, 43-44, 46) & P. Kment (42, 45).

posteriorly, narrowly rounded apically and regularly declining towards apex; scutellar apex nearly flat.

Hemelytra. Clavus with 3-4 irregular rows of punctures in widest place; apex of membrane slightly surpassing apex of abdomen (Fig. 79).

Thorax ventrally flattened; sternum between coxae deeply furrowed. Ostiole situated on small tubercle, round, directed obliquely ventrolaterad, accompanied with very small auricle

(Fig. 21); auricle about as long as ostiole wide; metapleuron around ostiole hardly depressed. Evaporatorium small, developed both on meso- and metapleuron; on mesopleuron, evaporatorium present as narrow strip along posterior margin (hardly visible in ventral view), slightly wider in posterolateral angle; on metapleuron, evaporatorium narrowly surrounding tubercle bearing ostiole and projecting as narrow strip mesad between meso- and metacoxae and laterad along anterior margin along thoracic spiracle and further laterad, forming distinct 'outlet channel'; gyrfication poorly developed.

Legs. Protibiae hardly widening towards apex, their outer surface distinctly flattened, lateral margins being carinated.

Abdomen only slightly narrower than pronotum across humeral angles; sternite III not depressed anteromedially. Laterotergites fully exposed dorsally, mediotergites completely covered with hemelytra; laterotergite III laterally distinctly bisinuate, with more or less protruding projection medially; laterotergites IV-VI slightly bisinuate laterally, laterotergites VII laterally straight (Fig. 79); dorsal surface of laterotergites nearly flat.

Male genitalia. Pygophore (Figs. 37-38) relatively large (pygophore width 1.05 mm, ratio of pygophore width to body length 0.19); ventral wall basally gibbose, posteromedially with deep round depression; ventral rim not developed, ventral wall continually merging into ventral rim infolding; ventral rim infolding directed posteriorly, not bent, shallowly and widely V-shaped medially, lateral projections low, rectangular, shifted laterad towards posterolateral angles (Fig. 38); posterolateral angles sharply pointed laterally (Figs. 37-38); lateral rim infolding without projection; paramere sockets distinct; apices of parameres visible, directed laterad. Paramere simple, laterally flattened, robust, apical portion about as long as basal portion, medially curved, ca. L-shaped, apex widely rounded (Fig. 49); apex of paramere, in dorsal view, neither widened, nor flattened. Phallosome of aedeagus basally oval, narrowing in apical part; sclerotized apical processes of median penial plates not observed in the only specimen examined, vesica apically surrounded by conjunctiva only (Fig. 54).

Female. Unknown.

Measurements of the holotype in Table 1.

Variation. There are differences in the shape of lobe-like projections between both humeral angles of the holotype.

Differential diagnosis. *Triplatyx kerzhneri* sp. nov. is habitually very similar to *T. dubius* and *T. quadriceps* (see the comments under *T. dubius*). *Triplatyx kerzhneri* sp. nov. is characterized by the following genitalic characters: posterolateral angles of pygophore sharply pointed laterally (Figs. 37-38); ventral wall of pygophore posteromedially with deep round depression; ventral rim not developed, ventral rim infolding directed posteriad, not bent, shallowly and widely V-shaped medially, with lateral projections low, rectangular, shifted laterad towards posterolateral angles (Fig. 38); apices of parameres directed laterad (Fig. 37); parameres robust (Fig. 49). Furthermore, *T. kerzhneri* sp. nov. has a well developed scutellar hump, the prominent and nearly quadrangular humeral angles of pronotum, the distinct callose dorsal midline reaching from base of clypeus to disc of scutellum, doubled on pronotum, and the very small auricle (approximately as long as the ostiole wide) (Fig. 21). However, examination of additional specimens is needed to consider the applicability of external characters for identification.

Etymology. I dedicate this species to late Izyaslav M. Kerzhner, the great Russian heteropterist, the author of many valuable contributions and great inspirer of my work. It is a pity that his early death prevented Izya from contributing to this volume as he originally promised.

Collecting notes. Unknown.

Distribution. Known only from the type locality in north-west Madagascar.

***Triplatyx quadraticeps* Horváth, 1904**

(Figs. 4-6, 13, 17, 22, 24, 32, 44-46, 50a-b, 55, 58, 74, 80-81, 86)

Triplatyx quadraticeps Horváth, 1904: 256-257. Description.

Triplatyx quadraticeps: BERGROTH (1908): 156. Catalogue.

Triplatyx quadraticeps: KIRKALDY (1909): 201. Catalogue.

Triplatyx quadraticeps: CACHAN (1952): 374. Redescription, key.

Type locality. Madagascar, Antongil Bay [= Baie d'Antongila] [15°26'S, 49°45'E for Maroantsetra].

Type material examined. LECTOTYPE: ♂, 'Madagascar / Antongil B. / Mocquerys [p, white label] // *Triplatyx* / *quadraticeps* Horv. [hw, white label, quirefold] // ♂ [p, white label] // LECTOTYPUS / *TRIPLATYX* / *QUADRATICEPS* / Horváth, 1904 / des. P. KMENT 2008 [p, red label]' (HNHM). The lectotype (Fig. 74, 80) is pinned through the right hemelytron; left protarsus, entire left hind leg, right mid leg (except for coxa and trochanter), and right hind leg (except for coxa) are missing; pygophore is detached, not dissected, mounted on white piece of card attached to the same pin. The lectotype is designated here to fix the species identity in context of the present revision and to avoid later confusion (see ICZN 1999: 74.7.3).

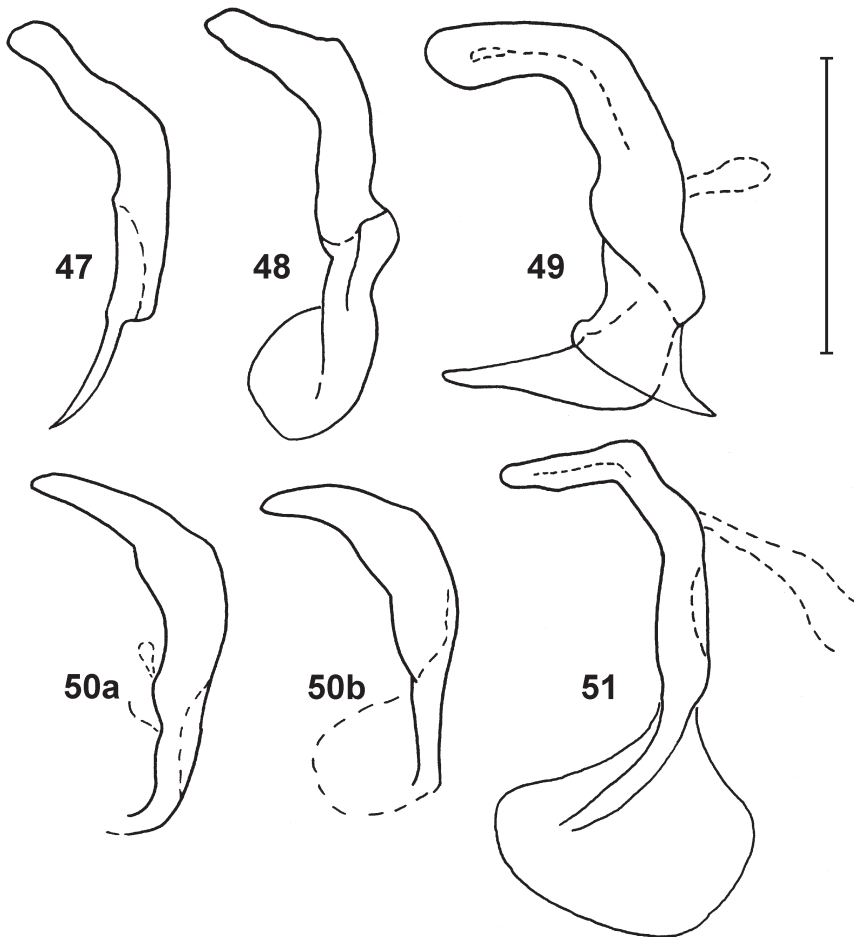
PARALECTOTYPES: 1 ♂ 1 ♀, 'Madagascar / Antongil B. / Mocquerys [p, white label] // ♂ resp. ♀ [p, white label] // PARALECTOTYPUS / *TRIPLATYX* / *QUADRATICEPS* / Horváth, 1904 / des. P. KMENT 2008 [p, red label]' (HNHM). Both paralectotypes are pinned through the right hemelytron; the male paralectotype with dissected pygophore, one paramere and proctiger mounted on a piece of white card, the aedeagus has unfortunately been lost.

Additional material examined. MADAGASCAR: Périnet [= Andasibe], 8.iii.[1]935, 1 ♀ 1 larva, Olsuf'ev lgt. (ZMAS).

Redescription. Adult (Figs. 74, 80). **Colouration.** Body dorsally brown; head posteriorly, pronotum and scutellum with pale callose median stripe; anterolateral margins of pronotum usually narrowly pale brown. Antennomere 1 brown in basal half, pale brown in distal half; antennomeres 2 and 3 pale brown; antennomeres 4 and 5 dark brown with pale brown bases. Eyes brown. Laterotergites each with small, narrow pale spot medially at their very margin. Ventral surface of body dark brown. Rostrum brownish, apically dark brown. Legs pale brown with irregular brown spots; claws in apical halves black. Abdominal spiracles black.

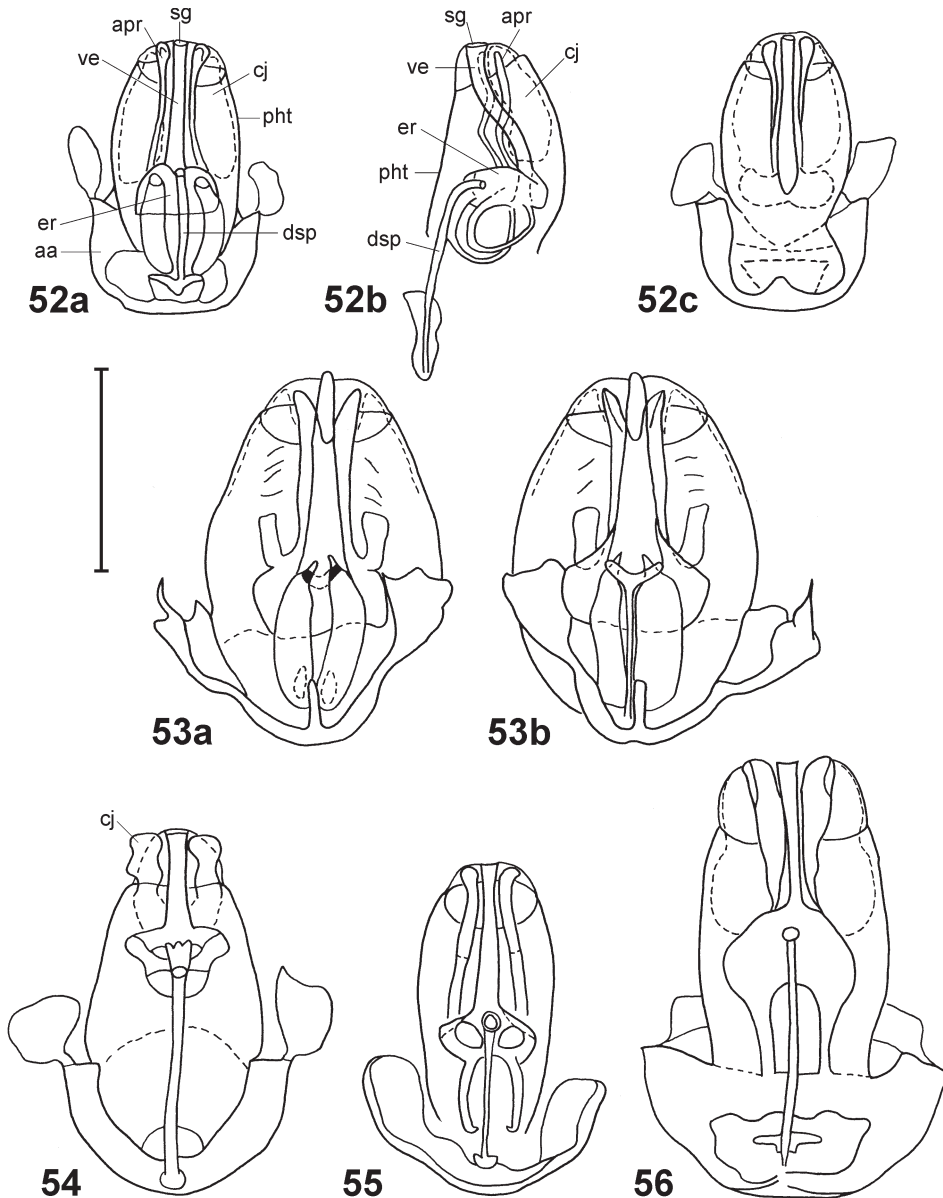
Sculpture. Body dorsally densely punctate; interspaces among punctures narrower than their diameters, if wider, than forming irregular, pale, convex callosities; punctures brown to dark brown, rarely black. Callosities beige, concentrated in the middle of frons, pronotum, and scutellum (here coalescent into longitudinal pale line), and on anterolateral pronotal margins (Fig. 80). Posterior part of pronotum, sides and apex of scutellum, clavus, and corium all with scattered small irregular callosities. Basal angles of scutellum with small, elevated, globular beige callose grain. Ventral surface of body very densely punctate, punctures on thorax distinctly larger than those on head and abdomen, abdomen medially with much sparser punctation than on sides; thorax with scattered irregular beige callosities, especially on acetabula (Fig. 17). Legs without distinct punctures.

Structure. **Head** strongly declivous, nearly trapezoid in outline (Fig. 4). Lateral margins in front of eyes with triangular anteocular spine, more anteriorly lacking distinct incision;



Figs. 47-51. Paramere, lateral view. 47 – *Triplatyx bilobatus* Cachan, 1952 (Isalo NP); 48 – *T. dubius* Jensen-Haarup, 1931 ('Madag'); 49 – *T. kerzhneri* sp. nov. (♂, holotype, Maromandia); 50a-b – *T. quadriceps* Horváth, 1904 (two different views – paralectotype, Antongil Bay); 51 – *T. stysi* sp. nov. (paratype, Ambodinifody env.). Scale bar = 0.5 mm.

paraclypei foliaceous, flattened, long and wide, from antecular spine on obliquely widening laterad, anteriorly regularly arcuate mesad with anterior margin nearly straight; paraclypei meeting in front of clypeus, forming minute, hardly distinct triangular incision; surface of paraclypei slightly depressed medially in front of eye and slightly raised anterolaterally; anterior margin both dorsally and ventrally without setae. Clypeus and frons very slightly convex. Antennomeres ordered from shortest to longest as $3 \leq 1 \leq 2 \leq 4 < 5$. Bucculae regularly narrowing anteriad, evanescent, posteriorly slightly narrowed and rounded apically, lower margin slightly insinuated medially (Fig. 5). Rostrum with apex reaching between metacoxae.



Figs. 52-56. Phallus. 52a-c – *Triplatyx dubius* Jensen-Haarup, 1931 (a – dorsal view, b – lateral view, c – ventral view; a, c – ‘Madag’, b – Lambomakandro); 53a-b – *T. bilobatus* Cahan, 1952 (a – dorsal view, b – ventral view; Isalo NP); 54 – *T. kerzhneri* sp. nov. (dorsal view; holotype, Maromandia); 55 – *T. quadriceps* Horváth, 1904 (dorsal view; paralectotype, Antongil Bay); 56 – *T. stysi* sp. nov. (dorsal view; paratype, Ambodinifody env.). Scale bar = 0.5 mm; abbreviations: aa – articular apparatus, apr – apical process of median plate, cj – conjunctiva, dsp – ductus seminalis proximalis, er – ejaculatory reservoir, pht – phallosome, sg – secondary gonopore, ve – vesica.

Pronotum (Fig. 13). Anterolateral angles truncated, laterally with distinct spine; anterolateral margins concave, carinate, bearing one short triangular spine medially and one additional spine laterally near humeral angles. Humeral angles wide, distinctly produced anteriorly, slightly declivous, widely rounded, laterally with 5-6 small, more or less lobe-like projections; the most posterior projection usually slightly protruding from arcuate outline of pronotum; margins of pronotum behind humeral angles slightly convex, regularly narrowing towards scutellum; posterior margin slightly concave. Disc anteriorly and medially nearly flat, obliquely descending towards head, without any elevation; dorsal surface of humeral angles confluent with rest of pronotum, only slightly concave basally; posterior part of pronotum distinctly convex sublaterally, slightly convex to nearly flat medially, confluent with anterior surface of scutellum or pronotum and scutellum forming very obtuse angle (Fig. 74).

Scutellum. Basal angles shallowly depressed; scutellar disc elevated, forming high, round hump (Fig. 74), occupying anterior two-thirds of scutellum with anterior surface convex, more or less confluent with pronotum; sides of scutellum slightly concave in midlength, posteriorly rounded and regularly declining towards apex, lacking any elevation; scutellar apex wide, nearly flat.

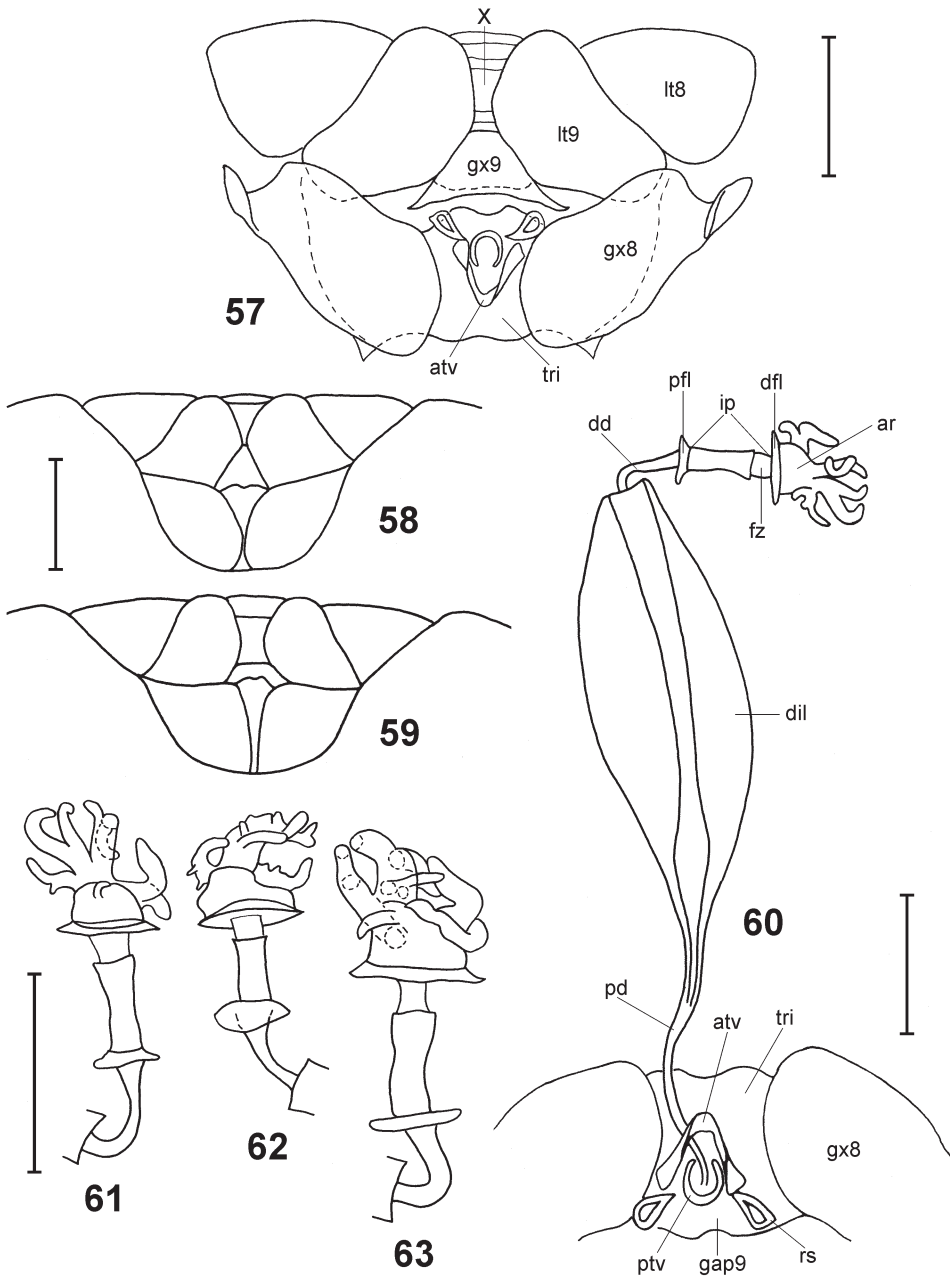
Hemelytra. Clavus with 3-4 irregular rows of punctures in widest place; apex of membrane not surpassing apex of abdomen (Fig. 80).

Thorax ventrally flattened; sternum between coxae deeply furrowed. Ostiole situated on small tubercle, round, slanted ventrolaterad, accompanied with very small auricle (Fig. 17); auricle about as long as ostiole wide; metapleuron around ostiole hardly depressed. Evaporatorium small, developed both on meso- and metapleuron; on mesopleuron, evaporatorium forming only narrow strip along posterior margin and widened in its posterolateral angle; on metapleuron, evaporatorium surrounding tubercle bearing ostiole and projecting as narrow strip mesad between meso- and metacoxae, and laterad on anterior margin along thoracic spiracle and further laterad, forming distinct 'outlet channel' (Figs. 17, 24); gyrfication poorly developed.

Legs. Protibiae hardly widening towards apex, their outer surface distinctly flattened, lateral margins carinated.

Abdomen only slightly narrower than pronotum across humeral angles; sternite III not depressed anteromedially. Laterotergites fully exposed dorsally, mediotergites completely covered with hemelytra; laterotergite III laterally distinctly bisinuate, with more or less protruding projection medially; laterotergites IV-VI slightly bisinuate laterally, laterotergites VII-VIII laterally straight (Fig. 32); dorsal surface of laterotergites nearly flat, sometimes with shallow depressions medially.

Male genitalia. Pygophore (Figs. 44-46) relatively small (pygophore width 0.88-0.90 mm, ratio pygophore width to body length 0.15; $n = 2$); ventral wall gibbose; ventral rim obscured, indicated only medially as short, hardly raised and obtuse ridge; ventral wall continually merging into ventral rim infolding, both deeply depressed subapically at base of posterolateral angles, the depression sharply delimiting the posterolateral angles; ventral rim infolding bent dorsally, shallowly concave medially, lateral projections nearly rectangular (Fig. 45); posterolateral angles more widely rounded laterally, lateral rim of posterolateral angles narrower; lateral rim infolding dorsally with tooth-shaped projection (Fig. 45, red arrow); paramere



sockets distinct; apices of parameres visible, curved, directed dorsolaterad. Paramere simple, laterally flattened, apical portion slightly longer than basal portion, medially curved, crescent-shaped, apically narrowly rounded (Fig. 50); apex of paramere in dorsal view slightly widened and flattened. Phallosome of aedeagus nearly parallel-sided basally, slightly oval apically, sclerotized apical processes of median penal plates narrow, well developed (Fig. 55).

Female genitalia (Fig. 58). Gonocoxites 8 with posterior margin slightly concave and sutural margin convex; both gonocoxites 8 almost in contact medially; gonapophyses 9 visible; posterior margin of laterotergites 9 narrowly rounded. Internal female genitalia not examined.

Measurements (all in mm). See also Table 1. The lectotype (♂): body length 6.0; head: length 1.65, width 2.1, interocular width 1.55; length of antennomeres: 1 – 0.35-0.4, 2 – 0.35-0.4, 3 – 0.3-0.35, 4 – 0.4-0.45, 5 – 0.6-0.65; pronotum: length 1.6, width 5.1; scutellum: length 2.55, width 2.7; abdomen width 4.95 mm. Females larger than males: ♂♂ 6.0 mm, ♀♀ 6.3-7.1 mm.

Larva (instar 5) (Fig. 81). Generally similar to adults in shape and colouration.

Colouration. Body brown, anterolateral margins of pronotum, sides of wing pads, and most of abdominal dorsum and venter pale brown. Apical antennomeres, ostioles of dorso-abdominal scent glands and abdominal spiracles black; tarsal claws pale brown.

Sculpture. Body with both dorsal and ventral surfaces densely covered with concolorous to brown punctures; legs covered with shallow concolorous punctures. No callosities developed.

Structure. Head (Fig. 6) nearly quadrangular, paraclypei less widening laterad, anterolaterally more rounded, with distinct medial triangular incision at tip of clypeus. Pedicel undivided, length of antennomeres ordered from shortest to longest as $1 < 4 < 5 < (2+3)$. Pronotum with posterior margin straight. Scutellum distinctly shorter than wide basally; disc elevated, forming a hump. Fore wing pads as long as, and covering most of, hind wing pads, anteriorly with triangular projection on lateral margin. Abdominal tergum with paired ostioles of all three dorso-abdominal scent glands.

Measurements in Table 1.

Variability. All four specimens examined differ slightly in the intensity of dark colouration of ventral surfaces of head and thorax, the density of black punctures on body, and the convexity of posterior margin of pronotum; there are prominent differences in the shape of humeral angles of pronotum, which can differ even between both sides of a same specimen.

Figs. 57-63. 57-59 – external female genitalia. 57 – *Triplatyx dubius* Jensen-Haarup, 1931 (dissected; Lambomakandro); 58 – *T. quadraticeps* Horváth, 1904 (native; paralectotype, Antongil Bay); 59 – *T. stysi* sp. nov. (native; paratype, Moramanga). 60 – Internal female genitalia of *T. dubius* (Lambomakandro). 61-63 – apical receptacle of spermatheca of *T. dubius* (61 – Madagascar, coll. Sicard; 62 – Madagascar, coll. Fairmaire; 63 – Lambomakandro). Scale bars = 0.5 mm; abbreviations: ar – apical receptacle of spermatheca, atv – anterior thickenings of vaginal intima, dd – distal part of spermathecal duct, dfl – distal flange, dil – dilatation of spermathecal duct, fz – flexible zone, gap9 – gonapophyses 9, gx8-9 – gonocoxites 8-9, ip – intermediate part of spermatheca, lt8-9 – laterotergites 8-9, pd – proximal duct, pfl – proximal flange, pvt – posterior thickenings of vaginal intima, rs – ring sclerites (= chitinellipsen), tri – triangulin.

Differential diagnosis. *Triplatyx quadraticeps* is habitually very similar to *T. dubius* and *T. kerzhneri* sp. nov. (see the comments under *T. dubius*). *Triplatyx quadraticeps* is characterized by the following genitalic characters: posterolateral angles of pygophore laterally rounded (Figs. 44-45); ventral wall of pygophore continually merging into ventral rim infolding, both deeply depressed subapically at base of posterolateral angles, the depression sharply delimiting the posterolateral angles; lateral rim of posterolateral angles narrower; lateral rim infolding dorsally with tooth-shaped projection (Fig. 45, red arrow); paramere as in Fig. 50. *Triplatyx quadraticeps* has also a well developed scutellar hump, a pale callose midline on pronotum and scutellum, more prominent humeral angles of pronotum, and a very small auricle (approximately as long as ostiole wide) (Fig. 22).

Collecting notes. The female and larva from Périnet were collected in March.

Distribution. Both known localities are situated in eastern Madagascar in drainage areas of rivers flowing eastwards to the Indian Ocean, grown with humid forests.

***Triplatyx stysi* sp. nov.**

(Figs. 7, 14, 18, 23, 25, 33-34, 39-40, 51, 56, 59, 75, 82-83, 85-86)

Type locality. Madagascar, Ranomafana National Park, environs of Ranomafana village [21°15'N, 47°27'E] (Fig. 89).

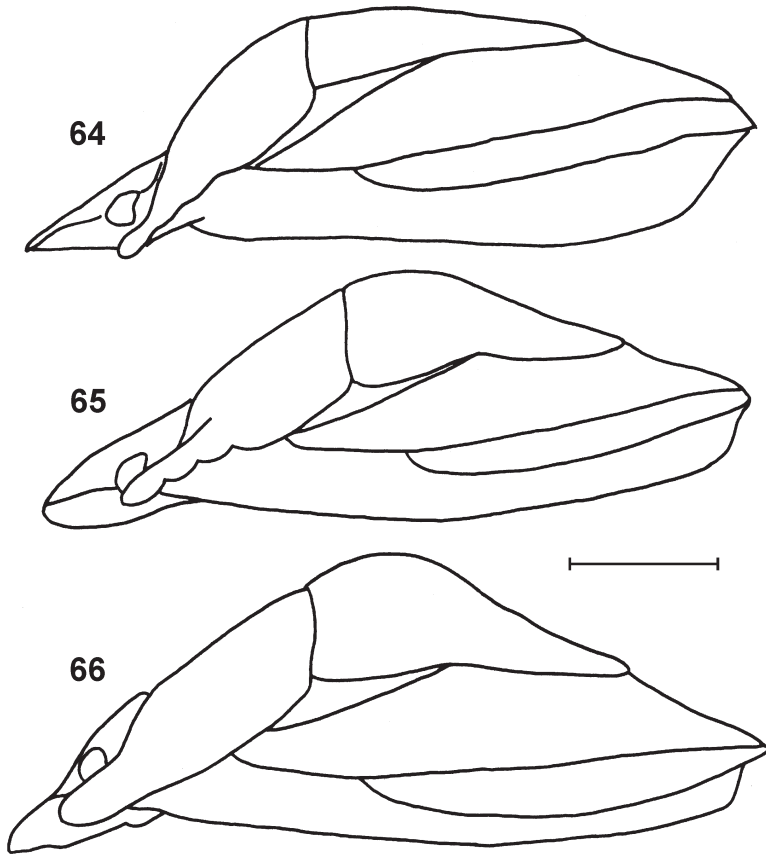
Type material. HOLOTYPE: ♂, 'MADAGASCAR, 2007, / Ranomafana Nat. Park, / near Ranomafana vill., Z. Mráček leg., 28.-31.i. [p, white label] // COLLECTIO / NATIONAL MUSEUM / Praha, Czech Republic [p, white label] // ♂ [p, white label] // HOLOTYPUS / *TRIPLATYX* / *STYSI* / sp. nov. / det. P. KMENT 2008 [p, red label]' (NMPC). The holotype (Figs. 75, 82) is cardmounted. Its right antennomere 5 is missing.

PARATYPES (1 ♂ 1 ♀): **MADAGASCAR:** (E), Tamatave (= Toamasina) province, Ambodifody env., 25.xii.1996, 1 ♂, I. Jeniš lgt. (ZJPC); Moramanga env., Rd. No. 2, km 116, 28.-29.xii.1996, 1 ♀, P. Švácha lgt. (NMPC). Both paratypes bear the following red label: 'PARATYPUS / *TRIPLATYX* / *STYSI* / sp. nov. / det. P. KMENT 2008 [p]'

Description. Adult (Figs. 75, 82-83). Colouration. Ground colouration pale brown, head and thorax ventrally dark to blackish brown. Antennae blackish brown, except for antennomere 1 medially and antennomere 2 basally pale brown. Eyes brown with silver lustre. Rostrum blackish brown. Apices of claws black. Abdominal spiracles black. Laterotergites each with whitish spot medially on outer margin.

Sculpture. Body dorsally sparsely punctate; interspaces among punctures wider than their diameters, sometimes convex but not forming callosities (Fig. 82); punctures dark brown to black. Anterior part of pronotum medially with short longitudinal ivory callosity (Fig. 14); scutellum in posterior part with impunctate double callose line on ridge, slightly widening and divergent posteriad (Fig. 82); basal angles without small globular callose grain. Head, thorax, abdomen, and femora ventrally densely covered with dark brown to black punctures. Tibiae with sparse but large brown punctures (Fig. 83).

Structure. Head only slightly declivous, nearly quadrangular in outline (Fig. 7). Lateral margins in front of eyes with triangular anteocular spine, more anteriorly distinctly but shallowly incised; paraclypei foliaceous, flattened, long and wide, anterior to incision regularly arcuate anteriorly, meeting in front of clypeus where leaving small triangular incision; paraclypei slightly depressed medially; anterior margin of paraclypei both dorsally and ventrally without setae. Clypeus slightly convex, frons nearly flat. Antennomeres ordered from shortest to longest as $1 \leq 3 < 2 \leq 4 < 5$, antennomere 2 distinctly longer than each of antennomeres 1 and 3. Bucculae regularly narrowing anteriorly, evanescent, posteriorly nearly rectangular, with medially slightly insinuated lower margin.



Figs. 64-66. Habitus of *Triplatyx dubius* Jensen-Haarup, 1931, lateral view. 64 – ♀, Anjahantelo; 65 – ♂, Ankara-fantsika forest; 66 – ♂, 'Madag'. Scale bar = 1 mm.

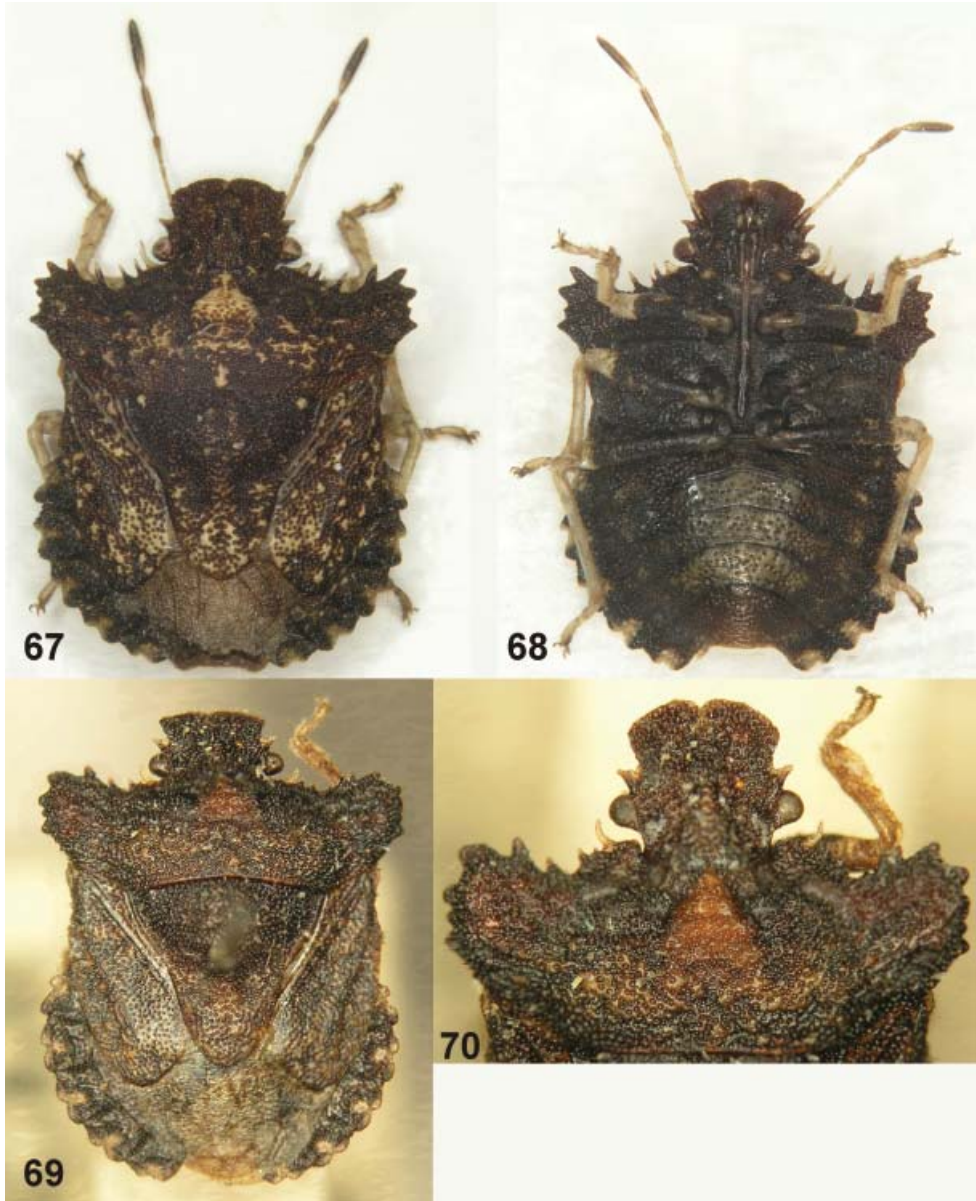
Pronotum (Fig. 14). Anterolateral angles truncated, lacking spine laterally; lateral margins concave, carinate, with one short, slender spine subapically to anterolateral margins, otherwise inerme or bearing one very small spine medially; humeral angles very wide, distinctly produced anteriorly and dorsad, almost rectangular, anteriorly with 2-3 usually large, triangular to lobe-like projections, laterally truncated, nearly straight, slightly to distinctly sinuate, posterior angle triangular. Behind humeral angles, margins of pronotum nearly straight, narrowing towards scutellum; posterior margin slightly concave. Disc anteriorly and medially almost flat, obliquely descending towards head, with low and wide longitudinal elevation in anterior half; dorsal surface of humeral angles confluent with rest of pronotum; posterior part of pronotum distinctly convex sublaterally, slightly convex to nearly flat medially, forming more or less obtuse angle with anterior part of scutellum (Fig. 75).

Scutellum. Basal angles shallowly depressed; disc strongly elevated, forming high triangular, apically rounded hump (Fig. 75), occupying most of scutellum length except for apex; hump anteriorly convex, distinctly detached from pronotum, lateral surfaces concavely insi-

Table 1. Measurements of *Triplatyx* Horváth, 1904 (all in mm). Measurements marked by an asterisk (*) were not available in all specimens examined.

Species	Body length	Head length	Head width	Interocular width	Antennomere I length	Antennomere II length	Antennomere III length	Antennomere IV length
<i>T. bilobatus</i>								
male (n = 2)	4.7-5.1	1.3-1.4	1.45	1.0	0.25	0.4	0.33	0.43-0.45
<i>T. dubius</i>								
male (n = 5)	5.0-5.4	1.35-1.6	1.75-1.8	1.25-1.4	0.3-0.35*	0.3-0.35*	0.3*	0.4-0.45*
female (n = 11)	5.4-6.0	1.25-1.55	1.65-1.85	1.25-1.45	0.3-0.35*	0.35-0.4*	0.3-0.35*	0.35-0.45*
<i>T. kerzhneri</i>								
male (n = 1)	5.4	1.6	1.85	1.35	0.3	0.35	0.3-0.35	0.45
<i>T. quadriceps</i>								
male (n = 2)	6.0	1.6-1.65	2.0-2.1	1.5-1.55	0.35-0.4	0.35-0.4	0.3-0.35	0.4-0.45
female (n = 2)	6.3-7.1	1.8	2.15-2.25	1.7-1.75	0.35-0.5	0.4-0.45	0.35-0.4	0.45-0.55
larva (n = 1)	5.1	1.4	1.8	1.35	0.35	0.7		0.5
<i>T. stysi</i>								
male (n = 2)	6.1-6.8	1.6-1.7	1.9-2.05	1.45-1.6	0.3-0.35	0.45-0.5	0.4-0.45	0.55
female (n = 1)	7.5	1.85	2.25	1.8	0.45	0.55	0.45-0.5	0.55

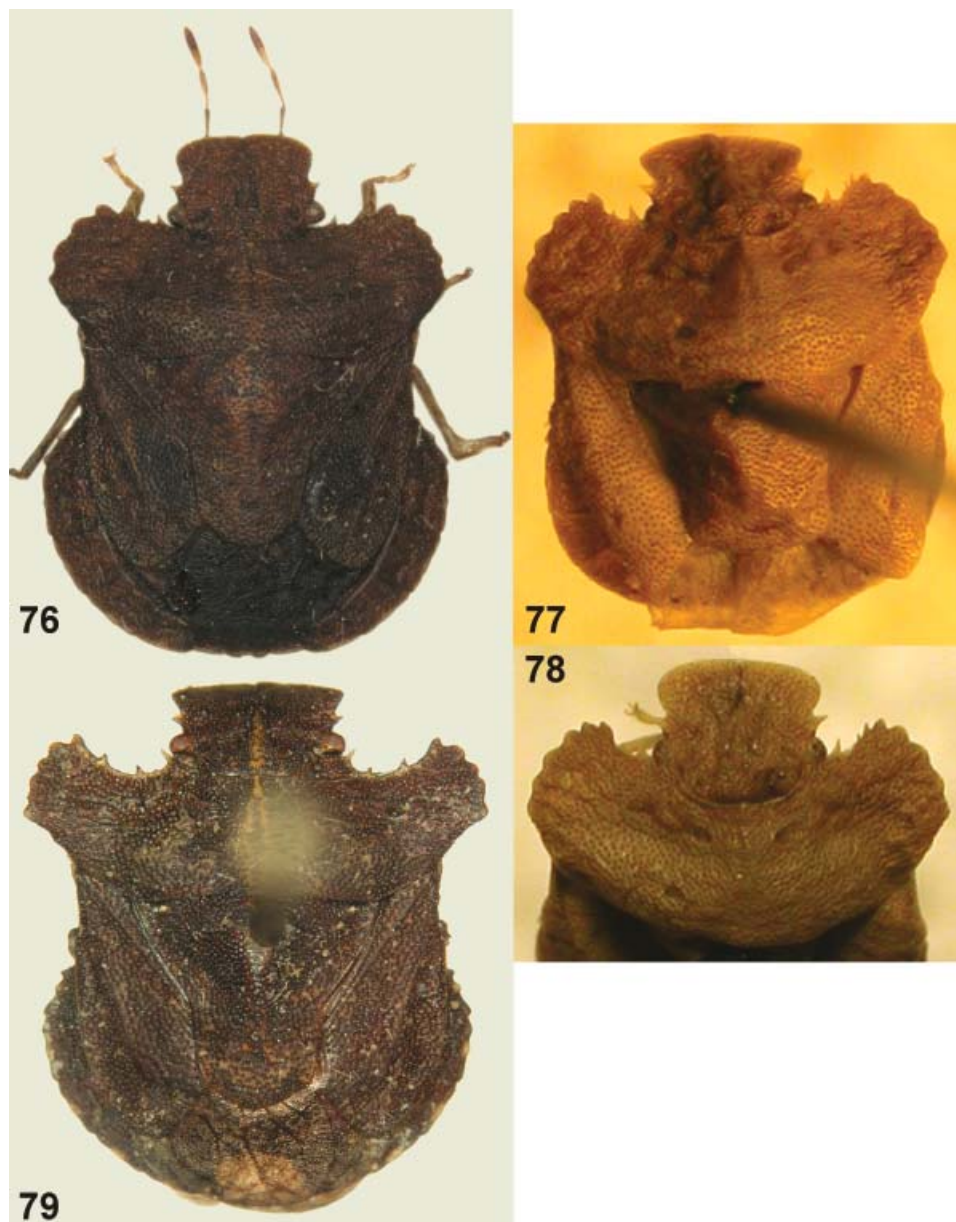
Species	Antennomere V length	Pronotum length	Pronotum width	Scutellum length	Scutellum width	Abdomen width
<i>T. bilobatus</i>						
male (n = 2)	0.6	1.25	3.6-3.85	1.8-2.0	1.9	3.45*
<i>T. dubius</i>						
male (n = 5)	0.5-0.55*	1.3-1.45	4.1-4.75	2.0-2.4	2.1-2.6	4.1-4.65
female (n = 11)	0.5-0.6*	1.35-1.55	3.9-4.65	2.1-2.55	2.1-2.65	4.1-4.8
<i>T. kerzhneri</i>						
male (n = 1)	0.6	1.4	4.85	2.35	2.6	4.55
<i>T. quadriceps</i>						
male (n = 2)	0.6-0.65	1.6	4.9-5.1	2.4-2.55	2.6-2.7	4.6-4.95
female (n = 2)	0.6-0.7	1.65-1.7	5.4-5.8	2.7-2.9	2.6-3.25	5.3-5.7
larva (n = 1)	0.65	1.0	4.7	1.2	3.0	4.25
<i>T. stysi</i>						
male (n = 2)	0.75-0.8	1.5-1.75	5.1-5.9	2.45-2.95	2.3-2.85	4.85-5.1
female (n = 1)	0.75-0.8	1.85	6.3	3.2	3.05	5.6



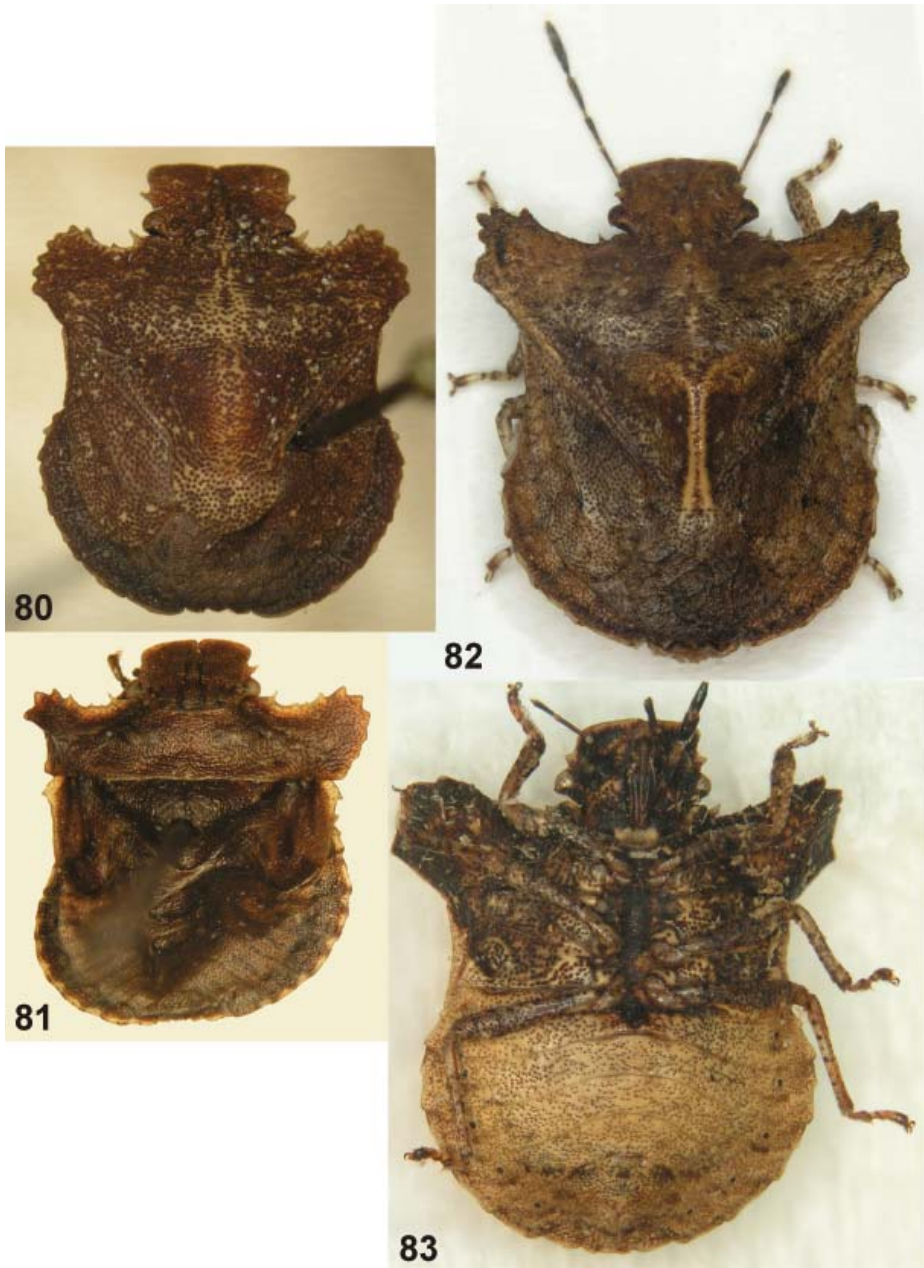
Figs. 67-70. Habitus of *Triplatyx bilobatus* Cachan, 1952. 67-68 – ♂, Isalo NP (67 – dorsal view, 68 – ventral view); 69-70 – ♂, holotype, Ambvombe (69 – dorsal view, 70 – detail of head and pronotum). Photo: J. Macek (67) & P. Kment (68-70).



Figs. 71-75. Habitus of *Triplatyx* species, lateral view. 71 – *Triplatyx bilobatus* Cachan, 1952 (♂, Isalo NP); 72 – *T. dubius* Jensen-Haarup, 1931 (♀, Zombitsy NP); 73 – *T. kerzhneri* sp. nov. (♂, holotype, Maromandia); 74 – *T. quadriceps* Horváth, 1904 (♂, lectotype, Antongil Bay); 75 – *T. stysi* sp. nov. (♂, holotype, Ranomafana NP). Photo: J. Macek.



Figs. 76-79. Habitus of *Triplatyx* species. 76-78 – *Triplatyx dubius* Jensen-Haarup, 1931: 76 – ♀, Zombitsy NP; 77-78 – ♀, holotype, Madagascar, coll. Sicora. 79 – *T. kerzhneri* sp. nov.: ♂, holotype, Maromandia. Photo: J. Macek (76, 79) & P. Kment (77-78).



Figs. 80-83. Habitus of *Triplatyx* species. 80-81 – *T. quadraticeps* Horváth, 1904: 80 – ♂, lectotype, Antongil Bay; 81 – larva, Périnet. 82-83 – *T. stysi* sp. nov.: 82 – ♂, holotype, Ranomafana NP; 83 – ♀, paratype, Moramanga. Photo: J. Macek (80, 82) & P. Kment (81, 83).

nuated and steeply descending to margins and narrowing posteriad, posterior part of scutellum forming very distinct longitudinal ridge (Fig. 82); apex of scutellum flat.

Hemelytra. Clavus with 4-5 irregular rows of punctures in widest place; apex of membrane not surpassing apex of abdomen (Fig. 82).

Thorax slightly convex; sternum between coxae deeply furrowed (Fig. 83). Ostiole situated on large tubercle, round, transverse (Fig. 18, 23), accompanied with small auricle; auricle approximately twice longer than ostiole wide (Fig. 23), metapleura around ostiole with deep round depression; evaporatorium on mesopleuron large (Fig. 25), forming wide strip along posterior and lateral margins; evaporatorium on metapleuron widely surrounding tubercle bearing ostiole and projecting as wide strip mesad between meso- and metacoxae, and laterad on anterior margin along thoracic spiracle and further laterad, the 'outlet channel' less distinct; gyrfication well developed.

Legs. Protibiae distinctly widening towards apex, outer surface distinctly flattened, lateral margin forming a sharp ridge.

Abdomen distinctly narrower than pronotum across humeral angles; sternite III distinctly depressed anteromedially (Fig. 83). Laterotergites fully exposed dorsally, mediotergites completely covered with hemelytra; outer margins of laterotergites very slightly but distinctly sinuate (Figs. 33-34), each laterotergite with one narrow lobe anteriorly and one posteriorly, last laterotergite only indistinctly insinuated medially; dorsal surface of laterotergites uneven, their lateral margin slightly depressed medially in outer half.

Male genitalia. Pygophore (Figs. 39-40) rather small (pygophore width 1.05 mm, ratio pygophore width to body length 0.17); ventral wall basally gibbose, apically slightly depressed; ventral rim well developed, arcuate, slightly concave medially; ventral rim infolding bent dorsally, deeply V-shaped incised medially, lateral projections large, rectangular (Fig. 39-40); posterolateral angles widely rounded laterally; lateral rim infolding without projection; paramere sockets very small and shallow, hardly distinct; apices of parameres not visible from above. Paramere simple, very slender, laterally flattened, apical portion much shorter than basal portion, medially angulately curved, L-shaped, apically rounded (Fig. 51). Phallosome of aedeagus parallel-sided, sclerotized apical processes of median penal plates large, clavate (Fig. 56).

Female genitalia (Fig. 59). Gonocoxites 8 with posterior margin slightly concave and sutural margins slightly convex, nearly parallel; gonapophyses 9 visible; posterior margin of laterotergites 9 narrowly rounded. Internal female genitalia not examined.

Measurements (all in mm). See also Table 1. Holotype (♂): body length 6.8; head: length 1.7, width 2.05, interocular width 1.6; length of antennomeres: 1 – 0.35, 2 – 0.5, 3 – 0.45, 4 – 0.55, 5 – 0.8; pronotum: length 1.75, width 5.9; scutellum: length 2.95, width 2.85; abdomen width 5.1 mm. Female markedly larger than both examined males: ♂♂ 6.1-6.8 mm, ♀ 7.5 mm.

Variation. All three specimens differ slightly in the intensity of dark colouration of ventral surfaces of head and thorax, the density of black punctures on body, and the convexity of posterior margin of pronotum; there are prominent differences in the shape of humeral angles of pronotum, which can differ even between both sides of a same specimen.

Differential diagnosis. Largest species of the genus, pale coloured, easy to identify using the combination of the following characters: head almost quadrangular, distinctly insinuated in

front of anteocular spine, sides of paraclypei regularly arcuate; humeral angles of pronotum very large, nearly quadrangular, distinctly turned upwards; anterolateral angles of pronotum truncated, lacking a spine laterally; posterior margin of pronotum forming an obtuse angle with anterior surface of scutellum; scutellum with very high, triangular hump, posteriorly bearing a prominent longitudinal ridge; basal angles of scutellum lacking elevated callose grain; evaporatorium very large, especially on mesopleura; protibiae distinctly widening towards apex; legs without apparent punctures; lateral margin of connexivum slightly but distinctly sinuate; and the genitalic characters.

Etymology. I dedicate this species to Prof. Pavel Štys (Charles University, Prague, Czech Republic) on the occasion of his 75th birthday with thanks for many advice and literature.

Collecting notes. The holotype was collected on a forest margin (Fig. 85). All known specimens were collected in December and January.

Distribution. Both known localities are situated in eastern Madagascar, in drainage areas of rivers flowing eastwards to the Indian Ocean, grown with humid forests.

Discussion

CACHAN (1952) included *Triplatyx* in the newly established tribe Triplatygini, which he characterized as follows: 'Paraclypei apically very large, longer than clypeus, having incision laterally in front of eyes, often emphasized by the presence of one anteocular spine. Lateral angles of pronotum lobe-like, more or less long and incised. Connexivum large and frequently incised. Scutellum variable, frequently large and rounded posteriorly. Mesosternum canaliculate. Pronotum and scutellum very convex. Peritreme of the metathoracic scent gland in the form of auricle'. Of these characters, especially the structure of head and the peculiarly developed humeral angles of pronotum seem to characterize well the three described genera of the Triplatygini. However, the auricle-shaped peritreme of metathoracic scent glands shared by all three included genera (Figs. 24-27) is also present in many other genera of the Pentatomoidea (e.g., of the Pentatomidae, Acanthosomatidae, Plataspidae, Dinidoridae, or Tessaratomidae: *Oncomerinae* – Kment, unpubl. data), and is therefore probably a plesiomorphic (or homoplastic) character. In his key, CACHAN (1952: 314-315) further included the Triplatygini in his 'Group II', including also the tribes Nealeriini, Memmiini, Phricodini, Halyini, Amyntorini, and Compastini [= Rolstoniellini], but his characterization of this group is only vague and of hardly more than identification value. Further improvement of our knowledge of the Triplatygini morphology (especially of the internal genitalia) is needed. It is possible that the extraordinary structure of the apical receptacle of spermatheca can be of some significance (cf. LINNAVUORI 1982).

Within *Triplatyx*, three morphological groups can be distinguished: *T. bilobatus*, *T. stysi* sp. nov., and a group of three very similar species including *T. dubius*, *T. quadraticeps*, and *T. kerzhneri* sp. nov. *Triplatyx bilobatus* differs from all remaining species by the thoracic venter distinctly convex (also shared with *Anoano* and *Tricompastes*), the almost quadrangular head deeply insinuated in front of anteocular spine, the anterior margin of head setose, the bucculae anteriorly rectangular, the pronotum with uneven surface, anterolateral angles not carinate and posterior margin forming sharp angle with anterior surface of scutellum, and the connexival margin strongly sinuate. *Triplatyx bilobatus* and *T. stysi* sp. nov. share the laterad



Figs. 84-85. Habitats of *Triplatyx* species: 84 – Isalo NP, locality of *T. bilobatus* Cachan, 1952; 85 – Ranomafana NP, type locality of *T. stysi* sp. nov. Photo: Z. Patzelt.

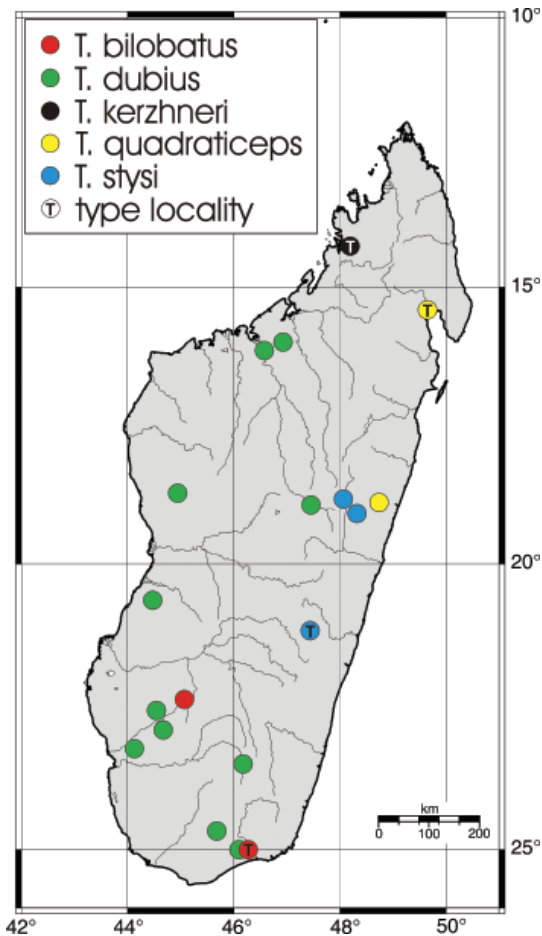


Fig. 86. Distribution of *Triplatyx* species in Madagascar.

evanescent, the anterolateral margin of pronotum carinate, and the pronotal surface nearly even. *Triplatyx dubius*, *T. kerzhneri* sp. nov., and *T. quadraticeps* are externally very similar and hard to distinguish, sharing the trapezoid shape of head, the more or less rounded humeral angles, the distinctly flattened thoracic venter, the ventrolaterad oriented ostiole, the lack of depression around ostiole, the very small auricle, the small evaporatorium forming distinct 'outlet channel', the protibiae hardly widening towards apex, and the legs without apparent punctures. Comparing with the other *Triplatygini*, the flattened thoracic venter, the reductions of auricle and evaporatorium, and the development of distinct 'outlet channel' are very probably synapomorphies of these three species. The formation of the 'outlet channel' has probably evolved by flattening of the pleura and the need to lead the scent secretion further laterad to be effective in defence. Among these species, *T. kerzhneri* sp. nov. differs markedly from the

oriented ostiole, the large auricle, the metapleuron around ostiole depressed, the large metapleural evaporatorium, the protibiae widening towards apex, and the punctate legs, while *T. bilobatus* and the three remaining species share the lateral spine on anterolateral angles of pronotum, the small, callose grain at basal angles of scutellum, the small mesopleural evaporatorium, the lack of depression anteromedially on sternite III, and a similar shape of parameres, which are externally visible in the pygophore. *Triplatyx stysi* sp. nov. is unique in the lack of lateral spine on anterolateral angles of pronotum, the markedly produced rectangular humeral angles; the lack of small callose grain at basal angles of scutellum, the large mesopleural evaporatorium, the presence of depression anteromedially on sternite III, and the very slender paramere with short apical part, not visible externally in the pygophore. In the structure of auricle and the extent of evaporatorium, *T. stysi* sp. nov. is rather similar to *Anoano pronotalis* (see Figs. 25-26). On the other hand, *T. stysi* sp. nov., *T. dubius*, *T. kerzhneri* sp. nov., and *T. quadraticeps* share the lack of setae on anterior margin of head, the bucculae anteriorly narrowing and

other two in several genitalic characters (the shape of pygophore, the robust paramere, and the aedeagus lacking sclerotized anterior processes of median penal plates). *Triplatyx dubius* and *T. quadraticeps* are clearly the most similar and certainly also most related species, differing only in details of the structure of the pygophore and parameres.

The biology of *Triplatyx* is nearly unknown. According to the locality labels, these bugs were collected several times in forests and once in a marshy habitat. The only exact piece of information concerns the specimen of *T. bilobatus* from Isalo National Park which was beaten off lower tree branches (M. Trýzna, pers. comm.). It seems probable that *Triplatyx* live on the bark of trees and/or tree branches. The body colouration and a tendency to flattening of the body venter, as well as the development of humps on dorsum, may be adaptations to a corticolous way of life.

A comparison of the known distribution of *Triplatyx* (Fig. 86) with geographic conditions of Madagascar brings certain implications. Madagascar is divided by a longitudinal chain of mountain ranges. The western and central parts of the island gently slope westwards to the Mozambique Channel, while the eastern parts decline steeply towards the Indian Ocean. This geographic division is widely reflected in the zonation of Madagascan vegetation. The more arid western and central parts are covered mostly with dry or dry spiny forests, wooded grasslands or bushland, while the humid eastern parts are naturally covered with humid forests (ANONYMUS 2008, MAYAUX et al. 2000). Despite the insufficient data, it seems that *T. bilobatus* and *T. dubius* are distributed in the predominantly arid western and central areas of the island, while *T. stysi* sp. nov. and *T. quadraticeps* occur in the humid eastern areas. The type locality of *T. kerzhneri* sp. nov. lies in north-western Madagascar under the western slopes of mountain ridges separating the northern part of the island from both the eastern and western-central parts. According to the present knowledge, *T. dubius*, *T. kerzhneri* sp. nov. and *T. quadraticeps* seem to be allopatric, possibly being geographical or ecological vicariants.

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