ACTA FAUNISTICA ENTOMOLOGICA MUSEI NATIONALIS PRAGAE

Vol. 13, No. 144

(Acta faun. ent. Mus. Nat. Pragae, 13: 75-85)

A new species of the genus Hoplitocoris Jeannel from Ethiopia (Heteroptera: Enicocephalidae)

By

PAVEL ŠTYS

Department of Zoology, University of Khartoum, Sudan

The genus *Hoplitocoris* Jeannel, 1942 (Heteroptera: Enicocephalidae, Enicocephalinae) is distributed in the Ethiopian (12 species), Oriental (2 species) and East Palaearctic (1 species) regions. In this paper a new species from Ethiopia is described, a list of the African species and their distribution is given and a division of the genus into 2 subgenera of allopatric distribution is proposed. A peculiar system of tendons and of fore tarsus and pretarsus is described in *Hoplitocoris ethiopicus* sp. n.; its arrangement may be characteristic of the whole family and is apparently unique in Heteroptera and probably in all insects.

I am greatly obliged to Dr. W. J. Knight (British Museum) for the loan of the type specimen and to Prof. Dr. A. Villiers (Mus. Nat. Hist. nat., Paris) and Dr. G. Schmitz (Mus. Afr. Centr., Tervuren) for their kind assistance during my studies in the collections in their charge.

Hoplitocoris (Hoplitocoris) ethiopicus sp. n.

Holotype: Q, Ethiopia, Addis Ababa, "A.O.I. Scioa", lgt. S. Patrizi, 7. 8. 1938 (coll. British Museum).

The right hind tarsus and the right 3rd and 4th abdominal segments are missing, the right fore tibia and tarsus are mounted separately.

Measurements (given in millimeters, always including the marginal fringe of scales). Total length 6.1. Head: length 1.58, length of the anterior lobe (up to the apex of anteclypeus) 0.85, length of the posterior lobe 0.46, maximum width of the anteocular portion (proximal to antenniferous tubercles) 0.30, the distance between the anterior margin of eye and the base of antenniferous tubercle 0.57, maximum width of the posterior lobe 0.42, width across eyes 0.38, minimum width of vertex 0.23. Antenna: length of segment I — 0.15, II — 0.38, III — 1.07, IV — 0.32. Labium: length of segment I — 0.23, II — 0.15, III — 0.61, IV — 0.08. Pronotum: medial length 0.63, length disregarding the posterior emargination 0.93, width between the apices of anterior processes 0.55, maximum width of the posterior lobe 0.26. Mesoscutellum: total length 0.44, maximum width 0.57. Length

of mesoscutellum and a visible part of metanotum together 0.68. Length of fore wings 3.50, maximum width of combined hemelytra 1.39. Fore femur: length 1.14, maximum width 0.25. Fore tibia: length including apical process and spines 1.44, length without apical armature 1.26, maximum width 0.25. Length of fore tarsus (including claws) 0.34.

Colour. Uniformly light brown, the extremities with a slight yellowish tinge; the anterior lobe of head, 1st segments of antennae and the labium and the apices of fore tibiae and fore tarsi slightly blackened.

Hairs. The whole body is densely covered with short, brownish yellow adpressed scales; those situated at the posterior margin of the posterior lobe of head are longer and form a fringe. The scales situated between anterior tubercles and in front of anteromedial tubercles of pronotum and on metanotum are rather long, more seta-like. The scale cover is most conspicuous on legs (fig. 2), veins of fore wings and abdomen. Sc, R, the common stem of M + Cu, and Pcu and 1An, before their fusion, with irregularly distributed scales (fig. 4); the other veins with 2 regular marginal rows of scales (fig. 5). The scales of the posterior margin of Sc are transversely situated and in dorsal view look like curved simple hairs. Simple setaceous hairs are present only on the distal part of the 3rd antennal segment, on the whole 4th segment and on the apices of tibiae and on tarsi, replacing there the scales. Depressions dividing tubercles on the medial lobe of pronotum and 2 longitudinal stripes on the inner (anterior) surface of fore femora are bare.

Structure. Head (fig. 1) very long, the anterior lobe subparallel (the margins slightly convex in the proximal half), 1.86 times as long as the posterior lobe, with 2 submedial longitudinal impressed lines and 2 small posterior tubercles opposite to the ocellar tubercle. Anteclypeus slightly protruding. Eyes small, the ocular index 3.0. The posterior lobe of head subquadrate, inconspicuously rounded laterally, only slightly longer than wide, with a medial longitudinal linear impression. The ocellar tubercles low, ocelli vertically situated on their sides.

Antennae (fig. 1) rather short, the 3rd segment 2.8 times as long as the 2nd.

Pronotum (fig. 1) with a fine medial longitudinal impression. The collum with a pair of long and thick subconical anterior tubercles which are strongly oblique and directed antero-laterad. The middle lobe with a pair of long, low, posteriorly directed posterolateral tubercles, which in dorsal view resemble thick, round carinae. The paired anteromedial and posteromedial tubercles of the middle lobe very small, the latter slightly larger, more elevated and closer to lateral processes, but both situated between the lateral processes. The posterior lobe rather small, its lateral margins straight and parallel, the posterior margin deeply excised (at an angle of about 110°). The sublateral carinae of the posterior lobe are high, thick and short, strongly divergent, posteriorly not

Hoplitocoris ethiopicus sp. n. Fig. 1. Anterior part of the body. Scales are omitted. Fig. 2. Scale cover of middle region of dorsal (anterior) surface of fore tibia.



sharply delimited, disappearing before they reach posterior margin of pronotum.

Mesoscutellum (fig. 1) truncate, slightly concave, with a deep, narrow, medial longitudinal impression, the posterolateral margins ramparted, the posterior margin not thickened medially. A considerable part of metanotum not covered by wings.

Macropterous, the venation of fore wings as in fig. 3. Medial and



Hoplitocoris ethiopicus sp. n. Fig. 3. Venation of fore wing. Remnants of medial and claval fractures indicated by dotted lines. Fig. 4. Scale cover of proximal part of R. Fig. 5. Scale cover of distal part of M.

claval fractures absent, a vague trace of the medial fracture present along the posterior margin of Sc before a transverse veinlet and along the anterior margin of R behind that veinlet. A similar remnant of the claval fracture situated along the anterior margin of Pcu.

Legs moderately long, thin, slightly flattened. Anterior femora (fig. 1) not thickened, parallel-sided. Anterior tibiae remarkably flat, imperceptibly widened apically, the apical margin diagonal, the distal inner angle produced in a short process. The cleaning apparatus (fig. 7) consists of 1 thick external long seta, a row of 17 long thin and 2 short setae, and 3 external long setae. The tibial process (figs. 6, 7) with 1 apical thick and robust spine, 1 small dorsal subapical peg, 1 dorsal and 1 ventral subapical marginal spine and 1 very long, curved inner spine situated at small, projecting, strongly sclerotized sclerite. The anterior tarsus 1-segmented, its distal inner margin provided with 1 curved dorsal subapical and 1 subtriangular ventral spine, and 1 semicircular dorsal apical and 1 subtriangular ventral apical lamina. Unguitractor longitudinally split, serrate, with a short straight empo-



Hoplitocoris ethiopicus sp. n. Figs. 6 and 7. Armature of right fore tibia and tarsus; ventral (fig. 6) and dorsal (inner, fig. 7) view. Cleared, only marginal hairs and scales are drawn, system of tendons is not illustrated. Fig. 8. System of tendons of

79

dial seta. Claws curved, simple, asymmetrical, the dorsal (inner) one much wider and longer than the ventral (outer) one. There is a distinct wear on the claws and on the apical spine of the fore tibia. The system of tarsal and pretarsal tendons (figs. 8, 9) is described in Discussion.

Middle and posterior legs without peculiarities, the tarsi 2-segmented, the inner (posterior) claw very slightly shorter than the outer one on the middle leg, both claws equal on the hind leg.

Discussion

a) Subgenera of the genus Hoplitocoris

The genus *Pseudenicocephalus* Usinger, 1945 (type species *Henicocephalus lewisi* Distant, 1903 from Japan) was considered synonymous to *Hoplitocoris* Jeannel, 1942 (type species *Henicocephalus kenyensis* Jeannel, 1919 from Kenya) by Usinger (1946) and all subsequent authors. I have studied almost all species of the genus and have found that *Hoplitocoris* should be divided in two subgenera, one comprising African species, the other the species from Asia. Usinger's genus must be thus retained as a subgeneric entity.

Key to the subgenera of *Hoplitocoris*

(Terminology is explained in fig. 10.)

1(2) Species from Asia. Anterior, anteromedial and posterolateral tubercles of pronotum form a more or less distinct external row of tubercles, the anteromedial tubercles being in an only slightly more medial position than the posterolateral tubercles, only the posteromedial tubercles are situated actually inwards compared with the posterolateral tubercles. Anteromedial tubercles usually high, in shape of conical or cylindrical processes, the posterolateral tubercles rather small, never reaching the level of anteromedial tubercles.

(Fig. 10) subg. Pseudenicocephalus Usinger, 1945

2(1) Species from Africa. The anterior and posterolateral tubercles of pronotum form an external row of pronotal tubercles, the anteromedial and posteromedial tubercles form an inner row; the anteromedial tubercles are usually conspicuously more medially situated than the posterolateral tubercles (inconspicuously in *H. pauliani* Vill. and *H. senegalensis* Risbec). The anteromedial tubercles always small and low, the posterolateral tubercles large and long, anteriorly usually (except *H. pauliani* Vill. and *H. senegalensis* Risbec) reaching the level of anteromedial tubercles (Fig. 11, 12) subg. *Hoplitocoris* s. str.

right fore tarsus and pretarsus, ventral view. Most of the structures of tibial and tarsal armatures are omitted. Fig. 9. As fig. 8, higher magnification, tendons are shown in the articulatory region between tibia and tarsus only.

Figs. 10—12. Schemes showing the relative position and shape of tubercles on anterior and posterior lobes of pronotum in the subgenera of *Hoplitocoris* Jeann. For better understanding the tubercles are drawn relatively smaller than their actual size. Fig. 10. Subg. *Pseudenicocephalus* Usinger. Fig. 11. Subg. *Hoplitocoris* s. str. (most species). Fig. 12. Subg. *Hoplitocoris* s. str. (as in *H. pauliani* Villiers).

Lettering: a — anterior tubercle, am — anteromedial tubercle, e — empodial seta, pl — posterolateral tubercle, pm — posteromedial tubercle, ta — margin of tarsus, ti — margin of tibia, tpt — tendon of pretarsus, tt — tendon of tarsus, ut — unguitractor.

Note: The figure of the pronotum of *Hoplitocoris (Pseudenicocephalus) indicus* Jeannel, 1942 by Jeannel (1942 a: fig. 27 e) is incorrect as to the relative size and position of pronotal tubercles. Wygodzinsky (1948, 1952) described and illustrated the middle lobe of pronotum in *H. vilhenai* Wyg. as having 2 pairs of tubercles only — this is incorrect and was corrected by Villiers (1959).

b) The species of *Hoplitocoris* s. str.

were keyed several times by Jeannel (1942), Villiers (1943, 1948, 1955, 1959, 1962, 1963) and Wygodzinsky (1948, 1952); the most recent Villiers's keys (1962, 1963) comprise all described species, most of which are known from unique specimens only. Their list and distribution and a few additional notes are given here. The subgenus may be conveniently divided into 2 species-groups.

List of species of the subgenus *Hoplitocoris* s. str.¹

a) Group "*jeanneli*": the 3rd antennal segment short, only about twice as long as the 2nd.

1. i	bilobus V	'illiers,	1962		÷					÷			. •	÷.,				Congo
2. ;	jeanneli N	Villiers,	1943							÷								Congo
3. 3	senegalen	sis Rist	bec, 19	950		•										•	•	Senegal
4.	wygodzins	skyi Vil	liers,	1959														Angola
tim	b) Group "kenyensis": the 3rd antennal segment long, at least 2.5 times as long as the 2nd																	
CTIT	00 00 10	ing us	110 2	unu.														
5. 6	angolensis	3 Villie	rs, 19	59														Angola
6. 6	camerunei	nsis Jea	nnel,	1942						(Cam	eroc	on,	Fer	nanc	lo	Poo,	Angola ²)
7. 0	ethiopicus	sp. n		•	•		•			•		•						Ethiopia
8. 7	kenyensis	(Jeann	el, 19	19)											•	K	Kenya,	Congo ³)
9. j	pauliani V	Villiers,	1948	•													Ivo	y Coast
10. 3	saegeri V	'illiers,	1962										• .					Congo
11. 1	vilhenai N	Nygodzi	nsky,	1948	4)				×.									Angola ⁵)
12. :	zuluensis	Villiers	, 1963	36)														Natal

Notes:

¹) Villiers (1963) recorded a nymph of a probably undescribed species from the Cape Province: I have examined a nymph of, perhaps, an undescribed species from Tanganyika, Elton Plateau, 9700 ft., 34.01 E, $9^{0}04'$ S, 7. 8. 1959 (coll. British Museum).

²) All references to *H. camerunensis* from Ivory Coast (Delamare-Debouteville 1948, Carayon 1951b) must be applied to *H. pauliani*.

³) Natal is mentioned in the distribution of *H. kenyensis* by Villiers (1959a: 111), but is not referred to in his later papers (1962, 1963). The reference of 1959 probably pertains to *H. zuluensis*.

⁴) The journal in which Wygodzinsky's description was published appeared in 1952, but the reprints with a separate pagination and different typographic make-up were printed (and probably distributed as well) already in 1948. The Wygodzinsky papers of 1948 and 1952 must be therefore regarded as separate publications, and *Hoplitocoris vilhenai* Wygodzinsky, 1952 should be, under strict application of nomenclatural rules, considered as a "homonymous" junior synonym to *H. vilhenai* Wygodzinsky, 1948.

⁵) Three specimens from Guinea (coll. Mus. Nat. Hist. nat., Paris) identified as *H. pauliani* are probably not conspecific with this species and might belong to a species undescribed as yet.

⁶) *Hoplitocoris zuluensis* was keyed (and hence differentiated from other species) in an earlier paper by Villiers (1962), but the proper description with indication of the holotype was published in a later paper (Villiers 1963).

c) Differential diagnosis of Hoplitocoris ethiopicus sp. n.

Hoplitocoris ethiopicus sp. n. belongs to the kenyensis-group, characterized by a long 3rd antennal segment. It differs by a large ocular index (3.0) from *H. garambensis* Vill., *H. pauliani* Vill. and *H. vilhenai* Wyg., whose vertex is approximately as wide as the eye. The ocular index is, however, always smaller in males and of the three species mentioned, only males are known, whereas the holotype of *H. ethiopicus* sp. n. is a female. However, the latter species further differs from *H. pauliani* by much more developed posterolateral tubercles on pronotum, from. *H. garambensis* by larger size $(6.1 \times 4.75 \text{ mm})$, smaller posterior lobe of pronotum and shorter pronotal carinae, and from *H. vilhenai* by a distinctly smaller posterior lobe of pronotum and by a smaller ratio of length of the 3rd to 2nd antennal segment $(2.8 \times 3.75 - 4.00)$.

Hoplitocoris ethiopicus sp. n. differs from H. zuluensis Vill. and from H. kenyensis (Jeann.) by a much smaller posterior lobe of pronotum; in further differs from H. zuluensis by shorter and thicker pronotal carinae and by larger size $(6.1 \times 4 \text{ mm})$, and from H. kenyensis by less robust and more curved anterior pronotal tubercles, by higher and more conspicuous posterolateral tubercles, by more sharply delimited anteromedial and posteromedial tubercles, by shorter, higher, thicker and less divergent carinae, by more diagonal anterolateral margins of the posterior lobe of pronotum and by a much thicker 3rd antennal segment, which is almost as wide as the 2nd segment (much thinner in H. kenyensis).

Species most resembling *H. ethiopicus* sp. n. are *H. camerunensis* Jeann., *H. angolensis* Vill. and *H. saegeri* Vill. The new species differs from all of them by larger size (6.1 mm in *H. ethiopicus*, 4.5—5.5 mm in *H. camerunensis*, 4.0—4.5 mm in *H. angolensis*, 4.5 mm in *H. saegeri*) and by a much longer and narrower anteocular portion of the head (ratio of the distance between the anterior margin of eye and the base of antenniferous tubercle to the width of head across the eye is 1.50 in *H. ethiopicus*, 0.93 in *H. camerunensis*, 1.08 in *H. angolensis* and about 0.85 in *H. saegeri*; ratio of the distance between the anterior margin of eye and the base of antenniferous tubercle to the maximum width of the anteocular portion of head proximal to the antenniferous tubercles is 1.90

in *H. ethiopicus*, 1.39 in *H. camerunensis*, 1.63 in *H. angolensis* and about 1.20 in *H. saegeri*). *Hoplitocoris ethiopicus* sp. n. further differs from *H. camerunensis* by a less sharply emarginate and less sublaterally rounded posterior margin of pronotum, by thicker anterior pronotal tubercles and shorter and stronger carinae, from *H. angolensis* by more conspicuous and less divergent pronotal carinae and by a more elongate mesoscutellum, and from *H. saegeri* by thicker anterior tubercles on pronotum and by a smaller ratio of length of the 3rd antennal segment to the 2nd (2.8×3.5) .

The new species may be included in Villiers's keys (1962, 1963), as follows:

9	The	posterior	lobe	of	pronotum	large				•			10
	The	posterior	lobe	of	pronotum	smalle	эr		•				10 b

The tibial and tarsal armature of the genus *Hoplitocoris* Jeannel is known in detail only in *H. ethiopicus* sp. n. and *H. vilhenai* Wyg. (Wy-godzinsky 1948, 1952). In both species the number and arrangement of spines and laminae is the same (Wygodzinsky's illustration shows presence of only 1 tarsal subapical spine instead of 2 found in *H. ethiopicus* sp. n., but this may be only an oversight). It is, therefore, probable that as in the genus *Henschiella* Horv. (Štys 1968) the basic patterns of this armature do not vary specifically and are stable at the generic level.

d) The system of tarsal and pretarsal tendons of the raptorial fore legs in Enicocephalidae has not yet been studied. The examination of its arrangement in *Hoplitocoris ethiopicus* sp. n. has revealed several generally interesting features and is described here (figs. 8, 9). The description is, however, tentative as to several points since only one specimen could be studied.

The articulatory membrane between the fore tibia and tarsus forms a distinct fold; its inner margin is slightly sclerotized. The tarsus has apparently a single tendon only. This tendon runs in the tibia parallel with the pretarsal tendon, diverges from it distad, runs along the distal margin of tibia, forms a loop around the ventral subapical tibial spine and becomes attached to the inner proximal corner of the tarsus. It runs, however, further on along the ventral (inner) edge of the tarsus and is finally attached to the tarsal wall at a place where the tarsal laminae are situated. The pretarsal tendon forms a distinct loop in the articulatory region, enters the tarsus and is attached to the proximal and dorsal (inner) surfaces of the unguitractor. Both tendons are provided with external membranose sheaths in the articulatory region; that of the pretarsal tendon stretches out into the proximal part of the tarsus, while that of the tarsal tendon seems to be continuous with walls of a thickened membranous ring situated in the articulatory membrane. Through this ring both tendons enter the tarsus. Both tendons are crossed in the articulatory region and are connected by an inner lunulate sclerotization in the base of the tarsus. Moreover, they are probably attached to each other at their final insertion in the apex of the tarsus.

The crossing and mutual attachments of both tendons suggest that the action of the tarsal muscle is reflected also in the movements of pretarsus and vice versa. It is also probable that any contraction of the pretarsal muscle results not only in flexion of claws, but also in motion of the tibial and tarsal spinose and laminar armature.

These conclusions are not surprising, since in such a type of raptorial fore legs, which occurs in Enicocephalidae, the movements of tarsus and pretarsus must be apparently correlated physiologically as well as mechanically, and some device is obviously necessary to regulate the motion of the complicated tibial and tarsal armature. Unfortunately, the functional significance of these structures has not yet been studied. The unusual type of the arrangement of tarsal and pretarsal tendons described above might be, however, characteristic of the whole family, and is apparently unique in Heteroptera and, perhaps, in all insects.

Summary

Hoplitocoris (Hoplitocoris) ethiopicus sp. n. (Heteroptera: Enicocephalidae, Enicocephalinae) from Ethiopia is described and compared with related species.

The tibial and tarsal armature and the system of tarsal and pretarsal tendons of the new species are described in detail. The arrangement of tendons is unique in Heteroptera and probably in all insects.

The genus *Hoplitocoris* Jeannel, 1942 is divided in two subgenera: African *Hoplitocoris* s. str. and Asiatic *Pseudenicocephalus* Usinger, 1945. *Pseudenicocephalus* was previously regarded as synonymous with *Hoplitocoris*. Both subgenera are keyed.

A list of species of *Hoplitocoris* s. str. is provided and notes on the distribution of some species are given.

References

(All papers containing important data on the classification or distribution of the African Hoplitocoris — species are cited below,, including those not referred to in the text.)

- Carayon, J., 1951: Ecologie et régime alimentaire d'Hémiptères Hénicocéphalidés africains. Bull. Soc. ent. France 56: 39-44, 1 fig.
- Delamare-Debouteville G., 1948: Sur la régime alimentaire des Zoraptères et leur prédateur Hoplitocoris camerunensis Jeann. — Bull. scient. Bourgogne, Dijon **11**: 97--98.
- Jeannel R., 1919: Voyage de Ch. Alluaud et R. Jeannel en Afrique Orientale (1911—1912). Résultats scientifiques. Insectes Hémiptères III. Henicocephalidae et Reduviidae. — Paris, Léon Lhomme, pp. 131—313, 30 figs., 1 phot., 1 pl.
- —, 1942: Les Hénicocéphalides. Monographie d'un groupe d'Hémiptères hématophages — Ann. Soc. ent. France 110 (1941): 273—268, 43 figs.
- -, 1943: Les Hénicocéphalides de Fernando-Po (Hem.). Bull. Soc. ent. France 48: 114-117, 5 figs.

- Risbec J., 1950: Sur une forme nouvelle d'Hoplitocoris (Henicocephalidae) de la Vallée du Fleuve Senegal. — C. R. 1er Conf. int. Africanistes Ouest, Paris 1: 298. 1 fig.
- Štys P., 1968: A review of the genus Henschiella Horv. (Heteroptera: Enicocepha-`lidae). — Acta Univ. Carol. Biol., in press.
- Usinger R., 1945: Classification of the Enicocephalidae (Hemiptera, Reduvioidae). *Ann. Ent. Soc. Amer.* **38**: 321—342, 3 figs.
- --, 1946: Notes on the synonymy and classification of the Enicocephalidae. Ann. Ent. Soc. Amer. **39:** 170.
- Villiers A., 1943: Note sur divers Henicocephalidae et Reduviidae africains (Hemiptera). — Rev. Zool. Bot. Afr. 37: 222-232, 11 figs.
- —, 1948: Note sur divers Hémiptères Hénicocéphalides de l'Ouest Africain. Bull. Mus. Nat. Hist. nat. Paris (2^e sér.) 20: 349—351.
- —, 1955: Les Henicocephalidae (Heteroptera) de la collection de l'Institut Français d'Afrique Noire. — Mém. Soc. ent. Belg. 27: 484—494, 5 figs.
- --, 1956: Hémiptères Henicocephalidae du Musée Royal du Congo Belge. -- Rev. Zool. Bot. Afr. 54: 290-294, 2 figs.
- —, 1959: Hémiptères Henicocephalidae du Musée de Dundo. Publ. Cult. Comp. Diam. Angola 45: 105—121, 23 figs.
- -, 1962: Henicocephalidae (Hemiptera Heteroptera). Explor. parc nat. Garamba Miss. de Saeger 1949-1952, Brusseles **32**: 3-36, 15 figs.
- --, 1963: Hemiptera [Heteroptera]: Henicocephalidae. In Hanström, Brinck and Rudebeck: South African Animal Life 9(3): 324-336, 19 figs.
- Wygodzinsky P., 1948: Sobre uma nova espécie de Hoplitocoris [Enicocephalidae, Hemiptera] de Angola (África Ocidental Portuguesa). — Comp. Diam. Angola, Serv. Cult., Mus. Dundo, Lisbon, pp. 5-8, 11 figs.
- -, 1952: Sobre uma nove espécie de Hoplitocoris (Enicocephalidae, Hemiptera) de Angola (África Ocidental Portuguesa). — Publ. Cult. Comp. Diam. Angola
 6: 31-33, 11 figs.

Acta faunistica entomologica Musei Nationalis Pragae, 13, No. 144 Redaktor RNDr. Jiří Dlabola, CSc. — Vydává Národní muzeum, Praha. Vyšlo 20. XII. 1968. Náklad 1100. — Vytiskla Státní tiskárna, n. p., Praha 1 - Malá Strana, Karmelitská 6, písmem Public.