A review of the Stygnicranainae (Opiliones, Laniatores, Cranaidae)

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Summary

Stygnicranaus concolor, new species is described in the hitherto monotypic genus Stygnicranaus Roewer, 1913. The male genitalia of a member of the subfamily are described and illustrated for the first time. Cranostygus Caporiacco, 1951 and Stygnicranaella Caporiacco, 1951 from Venezuela are based on juvenile Cranainae, possibly Santinezia. Tryferos Roewer, 1931 is the only other genus left in Stygnicranainae. A key is given for all species of the subfamily.

Introduction

The subfamily Stygnicranainae was erected by Roewer (1913) in the Gonyleptidae for animals in which coxa IV was hidden under the abdomen and the pedipalps were extremely elongate. At that time the subfamily comprised only one species, Stygnicranaus abnormis Roewer, 1913, supposedly from Colombia (but now thought to be from Venezuela — see Discussion). Later Roewer (1931) described a second monotypic genus and species, Tryferos elegans, from Ecuador.

Mello-Leitão (1932, 1939) included Stygnobates Mello-Leitão, 1927 and Zortalita Mello-Leitão, 1936, two monotypic genera from the Brazilian Atlantic Forest, in the Stygnicranainae. Soares & Soares (1946) described another monotypic genus, Gertia, from southern Brazil. Caporiacco (1951) described two monotypic genera from Venezuela, Cranostygus and Stygnicranaella.

Soares & Soares (1985) treated the Brazilian species of Stygnicranainae, and removed Gertia and Zortalita to the Gonyleptidae Sodrainae. Finally, Kury (1992) transferred Stygnobates to the Gonyleptidae Progonylepoidellinae. The subfamily Stygnicranainae has recently been removed from the Gonyleptidae to the Cranaidae (Kury, 1994).

From the examination of material from the Museum of Comparative Zoology, Harvard University, Cambridge, Mass. (MCZ), I have found two specimens representative of a new species, which is described below.

Provenances were located with Gazetteers of Colombia and Ecuador (United States Board on Geographic Names, 1957, 1964). All measurements are in millimetres. Abbreviations of other institutions are British Museum (Natural History), London (BMNH), Museo de Biologia, Universidad Central de Venezuela, Caracas (MBUCV), and Senckenberg Museum, Frankfurt am Main, older Roewer’s Collection (SMF/RI).

Family Cranaidae Roewer, 1913


Subfamily Cranainae Roewer, 1913

Mitobatinae (part): Simon, 1879: 266.


Remarks: The type species of Cranostygus and Stygnicranaella were described from juvenile specimens. Juveniles of Gonyleptoidea always have elongate pedipalps, making them superficially similar to the Stygnicranainae (see Discussion). There is evidence to think that C. marcuzzi and S. pizai are juveniles of Santinezia spp. (Cranainae, Cranainae), suggested by the large dimensions of the juveniles (3.8 mm for S. pizai and 11 mm for C. marcuzzi), since the species of Santinezia are very common in northern Venezuela and reach a large size.

Genus Cranostygus Caporiacco, 1951, nomen dubium


Cranostygus marcuzzi Caporiacco, 1951

Cranostygus marcuzzi Caporiacco, 1951: 26, fig. 14.

Types: Female juvenile holotype and two female juvenile paratypes (MBUCV 499), Venezuela, Aragua, Rancho Grande, 7 September 1949 (Racenis). Two male juvenile paratypes (Inst. ?), same locality, 30 December 1949 (Monk). Not examined.

Genus Stygnicranaella Caporiacco, 1951, nomen dubium


Stygnicranaella pizai Caporiacco, 1951

Stygnicranaella pizai Caporiacco, 1951: 24, fig. 13.

Types: Pullus holotype (MBUCV 471), Venezuela, DF, Caracas, El Junquito, 1949 (Marcuzzi). Not examined.

Subfamily Stygnicranainae Roewer, 1913


Diagnosis: Cranaidae with eye mound armed with paired stout spines, scutal area II projecting into area I until touching scutal groove I, area III armed with paramedian high spines, pedipalpus slender and very elongate forming a subchela, ventral plate of penis oblique in relation to truncus axis, with distal margin
slightly concave; stylus sigmoid, with apex swollen, without ventral or dorsal processes on glans penis.

Included genera: *Stygnicranaus* Roewer, 1913 and *Tryferos* Roewer, 1931.

Distribution: Colombia, Venezuela and Ecuador.

**Genus Stygnicranaus** Roewer, 1913

*Stygnicranaus* Roewer, 1913: 422; 1923: 570; Mello-Leitão, 1932: 128.

*Type species:* *S. abnormis* Roewer, 1913.

*Diagnosis:* Eye mound moderately low, armed with a pair of high spines; scutal area III with a pair of high spines; pedipalps elongate and slender in both sexes; pedipalpal tibia and patella dorsally smooth; tarsus I with more than six segments.

*Included species:* The type species and *S. concolor*, sp.nov.

Figs. 1–9: *Stygnicranaus concolor*, sp.nov. Male holotype: 1 Habitus, dorsal view; 2 Body, lateral view; 3 Cephalothorax, chelicerae and pedipalps, frontal view; 4 Body, dorsal view; 6 Right pedipalpal tibia/tarsus, ventral view; 7 Tarsus I, lateral view; 8 Tarsus III, lateral view; 9 Tarsus IV, lateral view. Female paratype: 5 Body, dorsal view. Scale lines=1.0 mm, except Fig. 1=5 mm.
Stygnicranaus abnormis Roewer, 1913

Type: Male holotype (SMF/R1), [Venezuela], Maracaibo. Not examined.

Stygnicranaus concolor, sp.n. (Figs. 1–11)

Type material: Male holotype and female paratype (MCZ), Colombia, Dpto Antioquia, Urrao, Parque das Orquideas (6°20'N,76°11'W), 1–7 July 1985, leg. Marco A. Serna.

Etymology: Species name refers to the absence of contrasting granules and of white spots on scute.

Diagnosis: S. concolor differs from S. abnormis by the absence of lighter granules and white spots on the scute, and by having tarsus I eight-segmented (seven in S. abnormis).

Male holotype: Cephalothorax 6.10 wide, 4.98 long, abdominal scute 7.72 wide, 3.96 long. Eye mound 2.79 wide. Stigmatic area 5.08 wide, 5.18 long. Distance between stigmata 2.24. Pedipalpal coxa 2.44 long. Body: Large harvestman, with very long legs (Table 1). Dorsal scute (Fig. 4) subrectangular, strongly bowed in abdominal portion, narrowest at posterior margin. Sides of prosomatic scutedivergent anteriorly. Anterior margin of carapace with transverse row of setiferous tubercles on each side. Eye mound armed with two stout divergent spines (Fig. 3). Prosoma smooth. Mesotergum divided into three areas without trace of area IV. Area I divided into two halves by projection of area II, armed with two small spines. Area II only with a granule row. Area III armed with two strong paramedian spines. Lateral and posterior margins of scute smooth. Free tergite I with two paramedian granules; free tergites II and III with a pair of spines each. Mouth parts (Table 1): Basal cheliceral segment reaching middle length of pedipalpal trochanter (Fig. 2). Cheliceral hand swollen, with a few hairs. Pedipalpal coxa very large, trochanter small with two dorsal tubercles; femur and patella very elongate and slender, unarmed (Fig. 1); tibia long, armed eclytically and mesally each with 4(iii) long spines with high sockets (Fig. 6); tarsus rounded in mid cross-section, armed mesally with a row of denticles and eclytically with 3 (iii) spines (Fig. 6).

Legs (Figs. 7–9, Table 1): Most segments unarmed, except trochanters III–IV with setiferous tubercles. Femur IV long, straight, with two rows of setiferous tubercles, and apical lateral tooth. Tarsal claws III–IV smooth, with tarsal process, without scopulae. Tarsal segments: 8–9/7/7. Ratio calcaneus/astragalus of metatarsi I–IV: 3.10/0.98/0.69/0.32. Colour: Body and appendages cinnamon-brown with black reticulations. Reticulations denser on posterior border of scute, venter and free tergites. Paired spines of tergites II–III yellow. Genitalia (Figs. 10–11): Ventral plate rectangular, oblique in relation to plan of truncus, armed with 3 distal bifurcate and 2 basal pointed setae. Distal border concave. Glans without dorsal or ventral processes, with inflatable sac formed by many seriate folds. Stylus long, sigmoid, apex swollen.

Female (Fig. 5, Table 2): Cephalothorax 5.38 wide, 4.25 long, abdominal scute 8.32 wide, 4.75 long. Eye mound 2.95 wide. Stigmatic area 4.88 wide, 4.67 long. Distance between stigmata 2.84. Pedipalpal coxa 1.93 long. Similar to male in body colour and general proportions. Spines of free tergites stouter. Femur IV unarmed. Tarsal segments: 8–2/13–7/7–7. Ratio calcaneus/astragalus of metatarsi I–IV: 3.00/0.85/0.73/0.35.

Genus Tryferos Roewer, 1931


Type species: T. elegans Roewer, 1931.

Diagnosis: Eye mound low, saddle-shaped, armed with a few low tubercles; scutal area III with a row of four sharp spines, the median pair stouter; pedipalps sexually dimorphic, elongate and slender in male; pedipalpal tibia and patella dorsally covered with coarse granules; tarsus I with 6 segments.

Included species: Only the type species.

Tryferos elegans Roewer, 1931

Tryferos elegans Roewer, 1931: 147, fig. 20; Soares & Soares, 1985: 194.
Key to the species of Stygnicranainae (see also Table 3)

1. Eye mound saddle-shaped with low tubercles; pedipalpal tibia and tarsus dorsally covered with coarse granulation; area III with four sharp spines
   - T. elegans

   Eye mound convex with two high spines; pedipalpal tibia and tarsus smooth; area III only with two paramedian spines
   - S. abnormis

2. Tarsus I seven-segmented; dorsum dark yellow with contrasting lighter granules and white spots
   - S. concolor

   Tarsus I eight-segmented; dorsum dark brown without lighter granules or white spots

Discussion

The very elongate coxa, femur and patella of the pedipalp, forming a functional subchela with the stout tibia and tarsus, is an advanced character which has developed convergently in at least four lineages of laniatorids. This kind of pedipalp occurs in the Epedanidae, Stygnidae, Biantidae and Gonyleptidae (Sdoreaninae and Progonyleptoidellinae). A roughly similar condition occurs in juveniles of Gonyleptoidae, but in this case the spines are relatively longer, the coxa, femur and patella are not so elongate, and the tarsus has a semicircular cross-section.

Some authors, probably not acquainted with laniatorid morphology, mistook juveniles for representatives of different taxa. This is the case with the Palpinidae, a family erected by Pickard-Cambridge (1905) for juvenile cosmetids (Roewer, 1923), and surely it is also the case with both genera of “Stygnicranainae” that were created by Caporiacco.

Members of the Stygnicranainae are closely related to the Cranainae, judging from external features and the genital morphology, and possibly should be included in the latter subfamily in order to turn it into a monophyletic group. Although there is no cladistic analysis at this level, it appears that the Cranainae (which lack any detected synapomorphy uniting exclusively its species) form a paraphyletic group if one excludes the specialised offshoot constituted by the Stygnicranainae. The close relationship between both nominal subfamilies is suggested by the probably synapomorphic oblique position of the ventral plate, eye mound structure and area II invading area I until touching the scutal groove.

The type locality of Stygnicrananus abnormis is almost certainly not Maracaibo, Colombia. There are four populated places by that name in Colombia, but none of them is large enough to be on maps. Maracaibo, Venezuela is the likely collection locality. Roewer (1913, 1923) was inconsistent in recording the country for Maracaibo and for other localities in Venezuela, but in the introduction of his paper on Gonyleptidae (Roewer, 1913: 257) he stated that his collections were from Maracaibo, Venezuela. In the description of Sabanilla, he listed the distribution of the single species as northern Colombia, but under the description of the type species he reported it as Sabanilla, Venezuela. Roewer (1943) cited “Maracaibo, Surinam” as the type locality of Poecilocranus gratiosus, and I determined material of this species from Puerto Cabello, Carabobo, Venezuela (Zoológisk Museum, Copenhagen), so this is surely another example of mistaken locality report by Roewer.

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References


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Three factors affecting the pitfall trap catch of linyphiid spiders (Araneae: Linyphiidae)

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Summary

The effects of three factors influencing the pitfall trap catch of linyphiid spiders was investigated using polypropylene pitfall traps with ethylene glycol as the trapping fluid. Dilution of ethylene glycol did not reduce its effectiveness as a pitfall trap fluid but the addition of detergent increased the trap catch by 50 to 100%. Some evidence was found to suggest that the daily catch of grassland spiders in pitfall traps declined as the frequency of emptying the traps decreased. Traps with rougher surfaces caught fewer spiders. The wear and tear caused by normal usage was found to reduce the catch of spiders when these traps were re-used.

Introduction

Pitfall traps are universally used to collect invertebrates, including spiders, from the ground stratum of many habitats. However, problems with their usage as an ecological sampling method have been cited by a number of authors (e.g. Adis, 1979; Desender & Alderweireldt, 1990; Topping & Sunderland, 1992). Unlike other disciplines it has not been common to test the efficiency of many sampling methodologies used in ecology, and in particular the pitfall trap. However, studies on the potential sources of error are necessary. Both activity (Heydemann, 1957) and trapability (Luff, 1975; Halsall & Wharram, 1988; Topping, 1993) are known to affect catch, but other factors such as the physical construction of the trap and placement may be equally important. This paper concerns three experiments used to assess the effects of some possible causes of error when pitfall trapping spiders.

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Trap fluid type

Spiders are soft bodied animals capable of climbing in and out of pitfall traps, thus for efficient trapping of spiders it is necessary to add a trap fluid to act as a preservative and a retaining agent. Previously used trap fluids include methylated spirits, ethylene glycol, formalin and peinyl mercuric acetate (Fichter, 1941; Uetz & Unzicker, 1976; Heydemann, 1956; Macfadyen, 1963). Formalin and ethylene glycol have been shown to be attractive to carabid beetles (Luff, 1968; Skuhrová, 1970; Holopainen, 1990), but no such effects have been suggested for spiders. It is also common practice to add a small amount of detergent to the trap solution in the hope of increasing the catch by reducing the surface tension of the trap fluid, as suggested by Bastedow (1976). However, the effect of this addition on the catch of spiders has not been quantified.

Length of time the trap is operating

Long trapping periods in the field can be used to reduce over- or under-recording which could occur if the trapping period coincides with a period of unusually high or low activity. Whilst traps cannot be in the field indefinitely, it would be a waste of effort to service them frequently if less frequent sampling would provide equally good results.

Trap surface texture

It has commonly been suggested that pitfall traps with rough surfaces would catch less, owing to the ability of the animals to crawl up the rough trap sides and escape. Kudrin (1971) demonstrated this effect, while others such as Luff (1975) showed that the material from which the trap was made affected the efficiency of the trap (glass>plastic>metal). In ecological sampling the use of glass traps is prohibited by practicality and safety, so recourse has to be made to the cheaper and safer plastic pot. However, as they are used plastic traps become dirty and scratched. Since it is unlikely that traps would