Relationships: Branched claws are present in most Triaenonychidae, but the peltonychium as a unique complex claw would be a potential synapomorphy for the genera of Travuniidae. However, similar structures develop in many apparently unrelated Travunioidea such as Synthetonychiidae (Forster, 1954), some Australian Triaenonychidae of the genus *Lomanella* (Hunt & Hickman, 1993), and the Argentinean troglobite triaenonychid *Picunchenops* (Maury, 1988). The monophyly of Travuniidae is not corroborated by any unique structure, but even so the presence of the peltonychium could be a synapomorphy (convergent in other Travunioidea). Travuniidae is most closely related to Cladonychiidaebecause the musculature of the penis is restricted to the base and the complex of the glans is short, with all median and dorsal components fused in a single structure. It is possible that Travuniidae is paraphyletic with respect to Cladonychiidae, because some of its genera (at least *Peltonychia*) appear closer to this family in genital morphology. The replacement of the peltonychium for a cladonychium could be a synapomorphy for Cladonychiidae in a scenario of a paraphyletic Travuniidae. The presence of additional opisthosomal sclerites in the genera *Yuria* and *Speleonychia* is a retention of a plesiomorphic state, shared with Pentanychidae. This would add support to a paraphyletic Travunioidea, but would need an extra ad hoc hypothesis of independent loss of those sclerites in other Travuniidae plus Cladonychiidae and in all other Laniatores.

Main references:

- **Systematics:** Absolon & Kratochvíl (1932a,b), Hadži (1935), Roewer (1935a), Suzuki (1975a), Martens (1980).
- **Natural history:** Suzuki (1975a), Marcellino (1982).

Triaenonychidae Sørensen, 1886

Adriano B. Kury

Etymology: *Triaenonyx,* from Greek *triaina* (trident, three-pronged fish spear) and *onyx* (claw).

Characterization:

- Size: Medium-sized Laniatores; body length typically 3 to 5 mm, although some South African Triaenonychinae can be much smaller (down to 1 mm), and on the other side some Adaeinae are much larger (up to 10 mm). Legs I–IV almost always short, 4–7/6–12/4–8/6–10 mm long.
- Dorsum (Figures 4.43a–c): Dorsal scutum width increasing backward without major constriction. Mesotergum seldom clearly divided into areas by grooves; usually areas are marked by arrangement of tubercle rows. No areas fused. Armature of areas and tergites usually weak, formed by small paired acuminate spiniform tubercles. Ocularium usually present, mostly very narrow and high with unpaired armature (Figure 4.430). Ocularium lacking sometimes, and eyes are sessile, placed close together. Eyes elevated, much higher than the level of the carapace (Figure 4.44h). Anterior margin of cara-

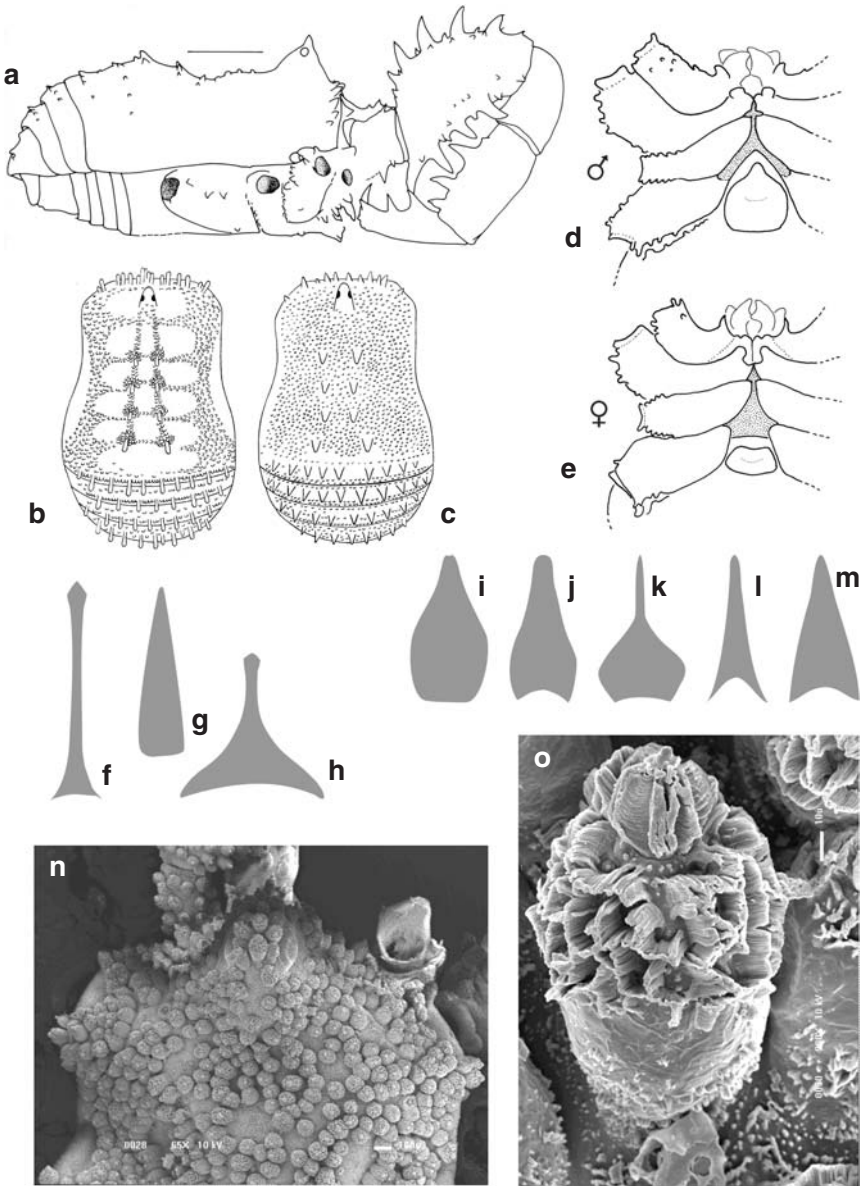

Figure 4.43. Triaenonychidae. (a) *Holonuncia katoomba* from Australia, habitus lateral (from Hunt, 1992); (b–c) South African Adaeinae, schematic granulation of *Adaeulum* (b) and *Larifuga* (c) (from Lawrence, 1933). (d–e) *Araucanobunus juberthiei* from Chile, coxae, sternum, and genital opercle of male and female (from Maury, 1993). (f–h) Typification of outlines of sternum of the three tribes of Triaenonychinae: (f) Triaenonychini; (g) Adaeini; (h) Triaenobunini (redrawn from Forster, 1954). (i–m) Further elaboration on the sternum outline of genera of South African Adaeini: (i) *Montadaeum*; (j) *Larifuga;* (k) *Paradaeum*; (l) *Adaeulum*; (m) *Cryptadaeum* (redrawn from Lawrence, 1931). (n) Undetermined Triaenobuninae from Chile showing complex ornamentation of tubercles of dorsal scutum; (o) detail of carapace tubercle (photos: A. B. Kury).

pace with rows of spines (Figures 4.43b,c, 4.44n). Ozopores hidden by a pad-shaped apophysis of coxa II.

- Venter: Coxae (Figures 4.43d,e) more or less parallel, coxa IV not greatly enlarged. Spiracles sometimes concealed by tubercles. Shape of sternum extremely variable (Figures 4.43f–m).
- Chelicerae: Hands usually not swollen and basichelicerite rarely with dorsal ornamentation of tubercles, but mesal pointed tubercles are common (Figure 4.44e).

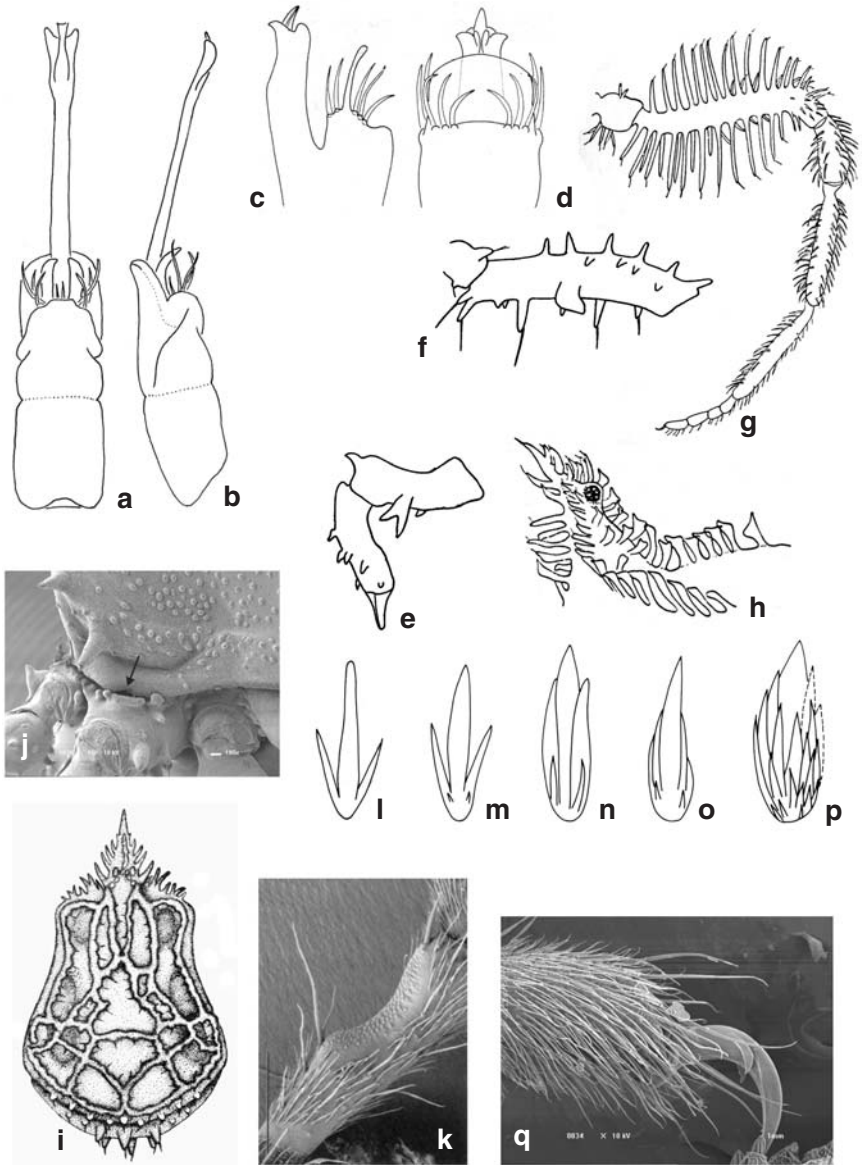

Figure 4.44. Triaenonychidae. (a–b) *Araucanobunus juberthiei* from Chile, penis, ventral and lateral (from Maury, 1993). (c–d) *Ceratomontia mendocina* from Argentina, penis, lateral and ventral (from Maury & Roig, 1985). (e–g) *Graemontia natalensis* from South Africa: (e) chelicera, mesal; (f) pedipalpal femur, mesal; (g) leg I, mesal (from Lawrence, 1937a). (h) *Ankaratrix illota* from Madagascar, ocularium, lateral (from Lawrence, 1959). (i) *Pristobunus henopoeus* from New Zealand, habitus dorsal (from Forster, 1954). (j) Undetermined, from Madagascar, ozopore arrowed (photo: A. B. Kury). (k) *Holonuncia cavernicola* from Australia, metatarsal notch (from Hunt, 1992); (l–p) *Lomanella* spp. posterior claws (from Hunt & Hickman, 1993). (q) Undetermined from Madagascar, typical three-pronged claw (photo: A. B. Kury).

- Pedipalps: Large, much stronger than legs, not crossed in the region of the trochanter. Armed with ventromesal and ventroectal spines in patella-tibia-tarsus (Figure 4.43a). Femur variedly armed with apophyses and spines, ventrally in many genera with strip of fine beadlike granules. Tibia and tarsus do not form a subchela.
- Legs: Usually short, substraight, and armed only with tubercle rows. Large, elaborate apophyses never present. Coxa I ventrally with strong frontal apophyses. Femur I in many species armed with ventral and/or dorsal rows of

setiferous spiniform processes (Figure 4.44g). Metatarsus I may be notched in males and provided with strong setae. Tarsi I–II with a single claw, III–IV with a multifurcate (usually trifurcate) claw (Figure 4.44q). Tarsal formula: 2–3(1–2):2–20 (usually 2–4):3–4:3–4.

- Genitalia (Figures 4.44a–d): Truncus penis filled with a single muscle. Glans very complex, with a full complement of noneversible sclerites, including a dorsal plate, dorsolateral plates, and a ventral plate. These are rarely found together in the same species. Sometimes the stylus is extremely elongate, and plates and spines may be fused with it.
- Color: Background usually yellowish, orange, or dark brown, with black mottling and reticulation. No white markings on dorsal scutum.
- Sexual dimorphism: Manifested typically in pedipalps, which in males are stronger and incrassate. In a few species chelicerae of males have supplementary spatulate mesal apophyses. Leg I tarsomeres in females may be slightly lower. In many species males possess a notch in metatarsus I. Also in some species the ocularium of males is more developed than that of females. The genital operculum may be elongate in males and wider in females. Male dimorphism (poeciloandry) reported by Forster (1954), Hunt (1985), and Maury and Roig (1985), where some males have secondary dimorphic features only weakly developed, though genitalia are normal.

Key to subfamilies:

1. Tarsal claws III–IV in adults with two to three pairs of accessory lateral branches. . . . . 2.
. Tarsal claws III–IV in adults with one pair of accessory lateral branches. 4
2. Tarsal claws III–IV in juveniles with three pairs of accessory lateral branches. . . . . **Paranonychinae**
. Tarsal claws III–IV in juveniles with four to five pairs of accessory lateral branches. 3
3. Tarsal claws III–IV in juveniles with four pairs of accessory lateral branches. . . . . **Kaolinonychinae**
. Tarsal claws III–IV in juveniles with five pairs of accessory lateral branches. . . . . **Nippononychinae**
4. Side branches of claws III–IV in adults much shorter than median prong. 5
. Side branches of claws III–IV in adults equal in length to or larger than median prong. . . . . **Sørensenellinae**
5. Diverticulum tertium of midgut with three caeca. . . . . **Triaenonychinae** (6)
. Diverticulum tertium of midgut with two caeca. . . . . **Sclerobuninae**
6. Sternum slender, with a spear-shaped anterior expansion and lateral expansions posteriorly. . . . . undetermined tribe

. Sternum subtriangular or wedge shaped, without anterior and posterior expansions. . . . . **Adaeini**

7. Width of posterior expansion much less than length of sternum. . . . . **Triaenonychini**

. Width of posterior expansion equal to or greater than the length of the sternum. . . . . **Triaenobunini**

Distribution: USA, Canada, Aleutian Islands (Umnak and Atka), Japan, Korea, Tasmania, continental Australia, New Zealand, subantarctic islands Crozet, Auckland, and Campbell, Madagascar, Chile, Argentina, and southern Brazil. Some triaenonychid genera are distributed across the Austral continents; the possibly nontriaenonychids of the Boreal temperate region also cross continents (Paranonychinae; see Shear, 1986).

Relationships: In Chapter 3 it is proposed to split Triaenonychidae, as traditionally conceived, into at least two different families. The Boreal genera should be grouped with Travuniidae, while the Austral genera represent Triaenonychidae *sensu stricto* and may include the strange Synthetonychiidae (Kury, 2002).

Main references:

- **Systematics:** Pocock (1902b), Roewer (1915b, 1931), Hickman (1958), Briggs (1971a), Suzuki (1975b, 1976e).
- **Natural History:** Lawrence (1938), Hunt (1972), Maury (1988).

Zalmoxidae Sørensen, 1886

Adriano B. Kury and Abel Pérez-González

Etymology: Zalmoxis is the name of a Thracian Dacian god.

Characterization:

- Size: Small Laniatores.
- Dorsum and Venter: Dorsal scutum campaniform, tending to pyriform (see Figures 4.45a–c,g). Ocularium well developed, unarmed or with small tubercles, far removed from frontal margin of carapace (Figures 4.45a–g). Frontal hump of carapace absent. Scutal area I usually longer than the others. Mesotergal grooves often V shaped. Scutal areas unarmed or with transverse rows of setiferous tubercles (*Traiania*) and armed with paramedian spines; free tergites and sternites unarmed or with transverse row of pointed tubercles (or median spiniform apophyses, as in *Stygnoleptes analis*).
- Chelicerae (Figure 4.45e): Weakly developed, basichelicerite short, with bulla clearly marked, hand small.
- Pedipalps (Figure 4.45f): Segments short and stout, never elongate. Femur with two ventrobasal spines and a mesal subdistal spine. Patella with mesal subdistal spine. Tibia and tarsus with mesal ventral and ectal ventral rows of