fully musculated truncus in the penis, it appears that muscle reduction was independently derived. A relationship with Pentanychidae was suggested by Briggs (1971b), not only on the basis of glans simplification, but also because of similarity in claw structure. For example, claws III–IV of *Pentanychus* have two apical branches enlarged to where further reduction of the basal ones would result in a cladonychiid claw. This reasoning suggests that the eastern Nearctic cladonychiids, which have small, vestigial branches on their claws, may be basalmost in the family.

Main references:

- **Systematics:** Hadži (1935), Briggs (1969), Cokendolpher (1985a), Martens (1978b), Tedeschi & Sciaky (1994).
- **Natural history:** Juberthie (1964)

Cosmetidae Koch, 1839

Adriano B. Kury and Ricardo Pinto-da-Rocha

Etymology: *Cosmetus*, from Greek *kosmetós*, ornate.

Characterization:

- Size: Body length 3–12 mm long, leg IV 4–54 mm long.
- Dorsum (Figures 4.24b–d,g,j,k): Dorsal scutum widest at area II or III. Ocularium is very low, saddle shaped, placed on middle of prosoma; each ocular globe bears a crest of small pointed tubercles or is smooth. Ozopores slitlike, one opening partially covered by tubercle of coxa II. Scutal areas are often indistinct; sometimes the sulci can be distinguished by color pattern or absence of tubercles; scutum and tergites are typically weakly armed (sometimes area III or IV or free tergites with strong spines or tubercles or fused spines, Figures 4.24j,k); anal operculum sometimes with stout apophyses; scutum normally covered with minute granules. Body can be extremely elongate. Coxa IV usually entirely visible or more rarely partially visible on dorsal view.
- Ventral (Figure 4.24h): Coxa I possesses ventrally a notch for the locking of pedipalpal trochanter, forming a channel flanked by apophyses that may show large variation in the diverse genera (C. P. Ferreira, pers. comm.).
- Chelicerae: Rear margin of basichelicerite has plenty of teeth and spines or is smooth.
- Pedipalps (Figures 4.24a,o): Coxa very short, trochanter much longer than wide, clavate; femur is strongly compressed laterally with serrate ventral margin sometimes also on dorsal. Tibia is spoon shaped, mesally concave, expanded ectally, and very weakly armed with ventral setae in all extensions or on distal half; tarsus is shorter than tibia with two rows of thin or thick ventral setae, claw slightly curved. The pedipalps cover the frontal part of the chelicerae, mainly the tibia, as a scutum. In nymphs the pedipalp is longer than in adults (especially the patella and tarsus), slender, and cylindrical (Juberthie, 1972, Goodnight & Goodnight, 1976).

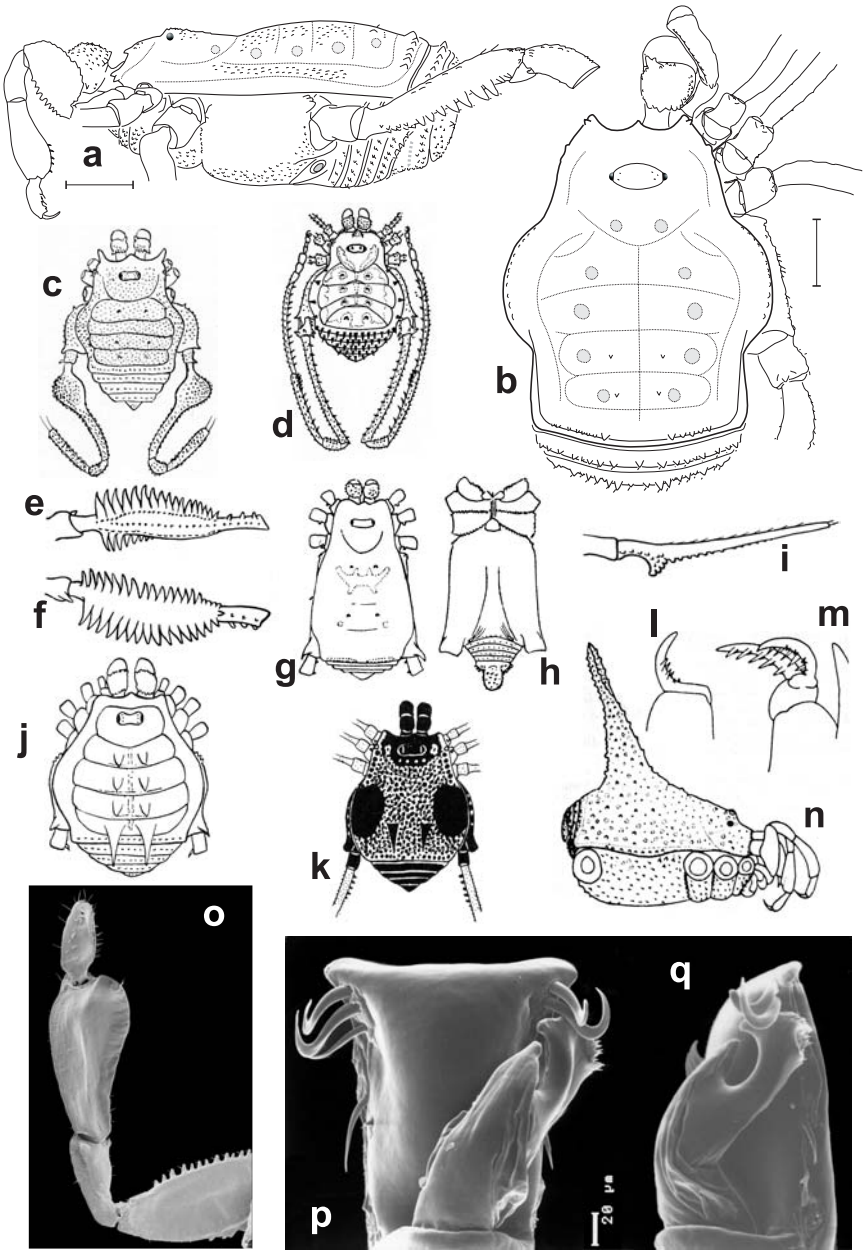

Figure 4.24. Cosmetidae. (a–b) *Ambatoiella vigilans* male from Ecuador, habitus: (a) lateral; (b) dorsal. (c) *Platycynorta clavifemur*, male from Peru (from Roewer, 1957a). (d) *Ferkeria vestita* male from Bolivia (from Roewer, 1947). (e–f) *Paecilaema pectinigerum*, from Honduras, femur IV; (e) prolateral; (f) retrolateral (from Roewer, 1923). (g–h) *Cynortula oblongata*, from Ecuador, habitus: (g) dorsal; (h) ventral (from Roewer, 1927). (i) *Eucynortula metatarsalis* from Mexico, metatarsus IV (from Roewer, 1923). (j) *Vonones octotuberculatus* from French Guyana (from Roewer, 1923). (k) *Metagryne albireticulata* from Peru (from Roewer, 1952). (l–m) *Cosmetus peruvicus* from Peru (from Avram & Soares, 1983): (l) tarsus I; (m) tarsus III, showing pectinate claws; (n) habitus lateral. (o) *Paecilaema* sp. from Brazil, femur to tarsus of pedipalp, ventral. (p–q) *Metavononoides* sp. from Brazil, distal part of penis: (p) dorsal; (q) lateral.

- Legs (Figures 4.24a,e,f,i): Short and thick with (e.g., *Flirtea*) or without tubercles or smooth, long, and thin. Males of species from the Northern Hemisphere tend to have more powerful leg IV (mainly femur, but also tibia and patella, Figures 4.24e,f) than southern ones. Male coxa IV with small process on apex. Distitarsve I with three to four tarsomeres, II with three to five. Tarsi III–IV

densely covered by short setae; claws III–IV parallel, smooth or pectinate (Figures 4.24l,m).

- Genitalia (Figures 4.24p,q). Penis is standard gonyleptoid and very conservative, with rectangular ventral plate, puffed sac-glans, and well-developed thumblike dorsal process. Distal margin of ventral plate straight to concave. Dorsal group of setae is always present; ventral group of setae is lacking in several genera. Stylus is bent in the apex with a barbed crest of serrate projections in almost all species, sometimes is slender and cylindrical. A ventral process is present in some Venezuelan genera. Most knowledge on cosmetid genitalia is from Venezuelan (González-Sponga, 1992b), Cuban (Šilhavý, 1966a) and Brazilian (Soares, 1974) species. Cokendolpher and Jones (1991) described the male genital system.
- Color: Pattern of dorsal scutum, free tergites, and legs from reddish to blackish brown, with variable shapes of whitish, yellowish, or even greenish patches. These patches are made of wax over the exocuticle, produced by glands probably on the cuticle, and can be removed with scalpels or forceps. Metatarsus sometimes with darker ring patches. *Rhaucus vulneratus* (from Colombia) possesses blood-red stripes.
- Sexual dimorphism: It may be present in the chelicerae swollen in males, or in femur and tibia IV thickened and with rows of similar spines in males. Some genera possess a male basitarsus I thickened. Females have genital operculum wider than in males. The males of the Brazilian species *Roquettea singularis* possess two pairs of immense protuberances on the scutum with unknown function.

Subfamilies: Two subfamilies are currently recognized: Cosmetinae with smooth claws on tarsi III–IV, and Discosomaticinae with pectinate claws on tarsi III–IV. Ringuelet (1959) rejected this subdivision on the basis of the absence of characters other than armature of claws and the great external similarity of genera with and without pectinate claws. Cosmetinae is diagnosed by a symplesiomorphic state, and there is no indication whether pectinate claws arose only once, characterizing Discosomaticinae as a clade.

Distribution: Cosmetidae is endemic to the New World. The peak of its diversity is in northern South America, Central America, and Mexico, where one-third to one-half of harvestman species are represented by this single family. They are numerous in the Amazonian and Andean realms and also in the Caribbean. They also reach southward as far as Argentina and southern Brazil (*Metalibitia*). A few species inhabit the Brazilian Atlantic forest, mostly belonging to *Metavononoides*. A few species now in *Vonones* reach far northward into the USA, where they occur in many of the southern states. The majority of species seem to have restricted distributions. In a survey along the Venezuelan coast, only one species (*Anduzeia punctatum*) occurred in three states (González-Sponga, 1992b), the other species being much more restricted. Cosmetids occur from sea level to altitudes as high as 4,150 m in *Oligovonones brunneus* (González-Sponga, 1992b).

Relationships: Cosmetidae doubtless belongs to Gonyleptoidea, where it shows a superficial resemblance to Assamiidae. It was hypothesized by Kury (1992a) to be closest to Gonyleptidae, and this placement has not been refuted up to now. The extraordinary similarity of basal gonyleptids such as Metasarcinae (Kury, 1994a) and supposedly basal cosmetids such as *Meterginus* reinforces this hypothesis of relationship, mainly based on the saddle-shaped ocularium and penis structures.

Main references:

- **Systematics:** Roewer (1912a, 1923), Mello-Leitão (1932), Goodnight & Goodnight (1953a, 1976), González-Sponga (1992b), Kury (1994a, 2003).
- **Natural history:** Parthasarathy & Goodnight (1958), Juberthie (1972), Goodnight & Goodnight (1976), Juberthie & Manier (1977), Cokendolpher & Jones (1991), Pinto-da-Rocha (1995b), Sabino & Gnaspini (1999).

Cranaidae Roewer, 1913

Ricardo Pinto-da-Rocha and Adriano B. Kury

Etymology: *Cranaus,* from the Greek anthroponym Cranaus, the successor of Cecrops as king of Attica.

Characterization:

- Size: Body length 6–16 mm, leg IV 21–95 mm long.
- Dorsum (Figures 4.25a,b,e,f,k): Widest at area II or groove III. Ocularium placed in the middle of the prosoma; rounded and high, with or without (some Prostygninae) median depression, small-tuberculate or with two high spines. Ozopores slitlike, one opening partially covered by a tubercle of coxa II. Area I divided (sometimes area II "invades" area I in the middle, as in Stygnicranainae and most Cranainae genera), normally with one tubercle on each side (most cranaines), and more elevated (Cranainae, except *Puna*); area II tuberculate; III with two spines upward or backward, rarely two round tubercles (*Allocranaus*). Tergite I normally small-tuberculate, with two spines (some *Santinezia*); II small-tuberculate, with two tubercles or one (*Tripilatus*); III normally with two spines, one large (*Licornus* and *Thaumatocranaus*) or small-tuberculate.
- Venter: Coxa IV small-tuberculate or with two tubercles or spines close to the spiracular area in males (cranaines: *Phareicranaus, Spinivunus* and *Santinezia*, Figures 4.25a–f). Posterior margin of spiracular area with large unpaired apophyses in males of some cranaines (e.g., *Alausius*, *Ventrifurca*, Figures 4.25a,c).
- Chelicerae: Segment I with few tubercles or densely tuberculate.
- Pedipalps (Figure 4.25d,f): Short and heavy or elongate and thin (Stygnicranainae); pedipalp dorsally coarsely tuberculate from trochanter to tibia (except *Cutervolus*, *Peladoius*, Stygnicranainae). Femur small-tuberculate, with a row of dorsal tubercles (as in most Prostygninae), or with a dorsoapical stout