

Orsima formica: A Bornean salticid mimicking an insect in reverse

Jonathan Reiskind

Department of Zoology,
University of Florida,
Gainesville, FL 32611, USA

Orsima formica Peckham and Peckham was described over 60 years ago from Sarawak, Malaysia (Peckham and Peckham, 1907). In their description the Peckhams remarked that "Mr. Shelford says that this species mimics an ant," and merely commented that "its form is certainly ant-like." No mention was made of its behaviour. In a recent trip to Borneo this species was observed alive and motion pictures were made of its behaviour. The penultimate female studied was found walking on a leaf surface in disturbed rainforest in the District of Temburong, Brunei.

Orsima formica is insect-like in reverse. The abdomen is strongly constricted with the posterior portion wider and head-like. The spinnerets are long and give the illusion of antennae and mandibles. The movement and posture of the spider enhance this resemblance. The spider often stands with the posterior ("head") end raised slightly above the horizontal (Fig. 1). The posterior spinnerets are long (25% of the length of the abdomen and about 60% the length of the "head"), are raised and resemble antennae. They are moved to the sides but not appreciably up and down and the angle of their divergence varies from 0° to over 100°. Periodically the abdomen is lowered and the median and anterior spinnerets attach a drag line thereby giving the illusion of mouthparts contacting the surface. In this process (and often independent of it) these spinnerets separate and come together by lateral movements that give the illusion of the opening and closing of mandibles. The anterior spinnerets are thick and fairly long (about ¾ the length of the posteriors) while the median spinnerets are thinner but of the same length and always move in conjunction with the anterior spinnerets. All three pairs of spinnerets as well as the distinct anal tubercle are darkly pigmented

and conspicuous. Additional characteristics that call attention to the posterior of the spider include iridescent blue-green scales on the abdomen and the dark pigmentation of the fourth pair of legs (the others having little pigmentation).

The insect-like appearance of *O. formica* is a generalized one (i.e. no single species of model can be designated) though it appears somewhat ant-like or possibly resembling a thin beetle. But in addition to the protection possibly derived from the Batesian mimicry their appearance probably allows greater opportunity to escape. The potential predator's attention can be diverted from the true head and upon approach the intended victim would depart in a direction opposite from the one expected thereby deceiving the predator which would tend to "lead" its prey during attack. Such deception has been observed in the posterior antennae-like wing extensions in lycaenid butterflies and fulgorids (Wickler, 1968).

The only other suggested case of reverse mimicry in spiders is that found in *Amyciaea forticeps* O.P.-Cambridge, another species that was observed in Borneo. *A. forticeps* has dark spots on a light orange abdomen which gives the illusion of the head of an *Oecophylla* ant with its dark compound eyes (Pocock, 1909, first noted this). However, morphologically and behaviourally the spider is quite ant-like in the ordinary fashion — i.e. its anterior end corresponding to the model ant's anterior (observed by both Badcock, 1918, and Hingston, 1928). The spider does not usually move backwards and, if the ab-

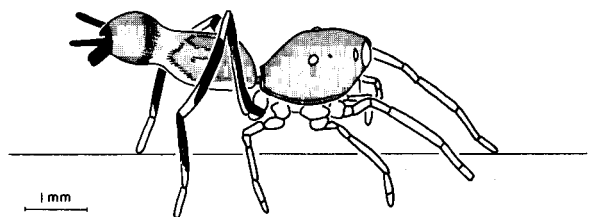


Fig. 1: *Orsima formica* drawn directly from a single frame of a motion picture film showing typical posture and position of spinnerets. Shading denotes darker pigmentation. Note the band of dark hairs that ring the back of the "head" region of the abdomen.

dominal spots mimic eyes, the illusion is only effective when the spider is at rest. Yet such spots may direct a predator's attack toward the "wrong" end of an immobile spider and allow a greater opportunity for escape. Hingston (1928) suggests the spots resemble a dark patch under the gaster of the *Oecophylla* model but field observations of these conspicuous spots suggest that they are indeed eye spots.

The function of the spinnerets in spiders is usually restricted to producing silk. Certain spider families have elongated spinnerets associated with the production of sheet webs (Agelenidae, Hahniidae) or for wrapping prey (Hersiliidae). In a few ant mimics the tapered spinnerets give a sting-like appearance to the tips of their abdomens (e.g. *Castianeira similis* (Banks)) but no mimetic spiders have used their spinnerets in the manner of and as effectively as *Orsima formica*.

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