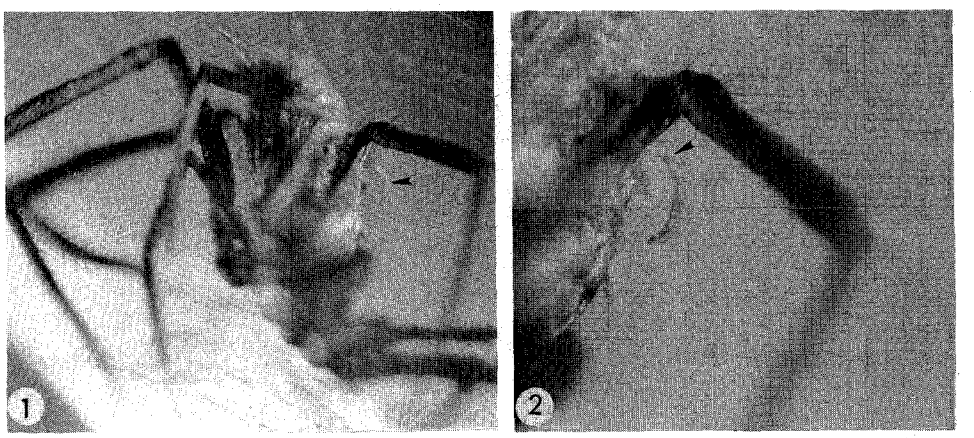
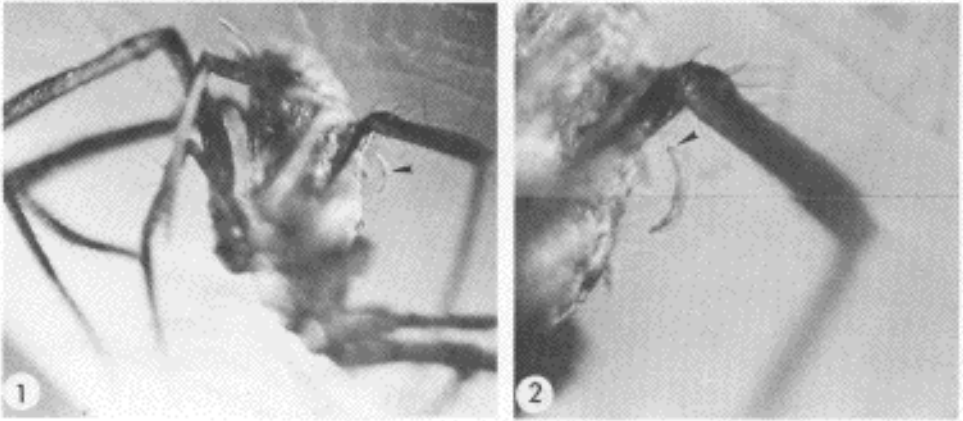
FOSSIL EVIDENCE OF SPIDER PARASITISM BY ICHNEUMONIDAE

A piece of amber containing a spider and associated insect larva was sent to the author by Mr. Jake Brodzinsky of Santo Domingo. The amber originated from the Dominican Republic, was golden brown, transparent and measured 10 by 5 mm. The insect larva, which was located just anterior to the spider's abdomen, appeared to represent a first instar ichneumonid. The body of the spider was 2.2 mm long and the curved legs extended another 1.4 mm on either side of the body. The adjacent insect larva was 0.29 mm long and 0.04 mm wide. It was 0.16 mm from the spider's abdomen. It possessed a distinct head capsule, 12 recognizable abdominal segments and a smooth integument. The spider was identified as an immature male Clubionidae.

Members of the tribe Polysphinctini (Ichneumonidae: Hymenoptera) are contemporary parasites of spiders or predators on spider eggs. The fossil form would fall into the former category. According to Nielsen, (1923. Entomol. Meddel., 14:137-205; 1935. Entomol. Meddel., 19:191-215) who accumulated a considerable amount of information on these "ichneumonid flys", the early instar larvae can remain for months on a spider in an inactive state. Most spider-parasitic Polysphinctini first sting the spider host into unconsciousness, then deposit their egg dorsally or laterally at the base of the spider's abdomen or on the posterior declivity of the cephalothorax (in the fossil form, the parasite is found just adjacent to the base of the spider's abdomen in a dorsal-lateral position). The eggs are attached by a mucilaginous material and the hatched larva sits exposed on the abdomen of its spider host and periodically feeds by puncturing the spider's integument with its mandibles and sucking up the extruded hemolymph. First instar larvae of polysphinctinids are described by Nielsen (1923, 1935) as having a large, sclerotized head, 13 body segments of diminishing width and a bare or minutely-spined integument. First instar larvae of representatives of Polysphinctini that were in the collection at Berkeley



Figs. 1-2—Fossil first stage larva of a member of the Polysphinctini in Dominican amber: (Magnification 20×). 1, position of the larva (arrow) in relation to the spider; 2, general shape of larva showing distinct head capsule (arrow) (Magnification 80×).



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measured 0.45 mm in length. However, the tribe is composed of several genera and a size variation of first stage larvae would be expected.

On the basis of size, morphology and location near the base of the spider's abdomen, it is concluded that the fossil larva is a member of the tribe Polysphinctini and that spider parasitism by these ichneumonids was well established some 20-40 million years ago. This is roughly the age of Dominican amber (Lambert et al., 1985. Archaeometry, 27:43-51). Fossil associations showing evidence of parasitism, such as this one, are rare in the geological record. I thank Dr. E. Schlinger for identifying the fossil spider and providing me with present-day larvae of Polysphinctini for comparative studies.

George O. Poinar, Jr. Department of Entomological Sciences, University of California, Berkeley, California 94720.

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