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ORIGINAL RESEARCH

New species of *Hambletonia* Compere (Hymenoptera: Encyrtidae) in Dominican amber

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ABSTRACT

The present paper describes a new species of encyrtid wasp, *Hambletonia dominicana* sp. nov. (Hymenoptera: Encyrtidae) from Dominican amber. Diagnostic characters include long antennae that are almost twice the length of the head, the absence of long, coarse, flattened setae on the dorsal apical margin of the pedicel and an elliptical club subequal in length to that of the funicle. This first described fossil species of *Hambletonia* provides views of new and possible unique morphological features of encyrtid wasps that existed in the Neotropics during the mid-Tertiary.

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Introduction

Encyrtids (Hymenoptera: Encyrtidae) are a highly specialized cosmopolitan group of parasitic wasps that attack a wide range of insects and even ticks. They are best known for parasitizing mealybugs (Hemiptera: Coccoidea) that destroy crop and ornamental plants (Clausen, 1962).

Among the many genera and species of encyrtid wasps described by Harold Compere is the genus *Hambletonia* that originated from Brazil (Compere, 1936). Sharkov and Woolley (1997) revised the genus and described several new species from Costa Rica and southern USA. Only a single host is known for members of this genus, which is the host of the type species from Brazil, namely the Pineapple Mealybug (*Pseudococcus brevipes* (Ckll.).

The present paper describes a fossil species of the genus *Hambletonia* from Dominican Republic amber, showing a combination of features of extant members of the genus (Trjapitzin, 1977; Noyes, 2000; Sharkov & Woolley, 1997; Goulet & Huber, 1993) along with some unique characters that existed in the Tertiary.

Materials and methods

The fossil originated from mines in the Cordillera Septentrional of the Dominican Republic. Dating of Dominican amber is controversial with the latest proposed age of 20-15 mya based on foraminifera (Iturralde-Vinent & MacPhee 1996, 2019) and the earliest as 45-30 mya based on coccoliths (Cêpek in Schlee 1990). Dominican amber was produced by the leguminous tree, *Hymenaea protera* Poinar (1991) and a re-construction of the Dominican amber forest based on amber fossils indicated that the environment was similar to that of a present day tropical moist forest (Poinar & Poinar, 1999).

Observations and photographs were made with a Nikon SMZ-10 R stereoscopic microscope and Nikon Optiphot compound microscope with magnifications up to 800 X. Helicon Focus Pro X64 was used to stack photos for better depth of field. The specimen is complete and well preserved and is adjacent to the remains of an unknown plant. Terms for characters used in the

descriptions were taken from Sharkov & Woolley (1997) and Noyes (2000).

Results

Order: Hymenoptera Linnaeus, 1758
Superfamily Chalcidoidea
Family: Encyrtidae Walker, 1837
Subfamily: Tetracneminae Howard, 1892
Tribe: Aenasiini Noyes & Hyat, 1994
Genus *Hambletonia* Compere, 1936
Hambletonia dominicana sp. nov.

LSID:zoobank.org:act:25DD7EB2-73D2-4AE8-BFB1-051C7525775B

Diagnosis: Long antennae almost twice the length of the head, extended radicle slightly longer than pedicel, scape with oval flap, absence of long, coarse, flattened setae on the dorsal apical margin of the pedicel, elliptical club subequal in length to that of the funicle, enlarged arolia.

Holotype: (female) deposited in the Poinar amber collection (accession # D-Hy-10-52) maintained at Oregon State University.

Type locality: La Búcara amber mine (19˚13´ x 70˚40´) in the northern portion of the Dominican Republic.

Etymology: The species epithet refers to the locality of the fossil.

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Description (Figs. 1-7)

General body color black to dark brown, antennae, eyes and legs light brown.

Head: Hypognathous, bearing two cavities at insertion of antennae; facial depression pronounced, separated from frontovertex by sharp carina with rounded margin; frontovertex flat, smooth, twice as long as broad, with two vertical rows of large setae; compound eyes large, bare, extending almost entire length of head, with posterior margin almost reaching occipital margin; interantennal prominence faint; antennae extended, large in proportion to head; nine jointed (scape, pedicel, 6 funicular joints and club); toruli close to midline of head, distance between toruli greater than distance between torulus and compound eyes on frontal vertex, approximately equal to distance between compound eyes; radicle elongate; pedicel lacking tuft of elongated hairs on dorsal side; funicular segments transverse; scape with broad, oval flap; clava solid, elliptical.

Mesosoma: Separated from metasoma by constriction; mesosternum very short.

Wings: Slightly fuscus with microsetae on margin and membrane; apex of wings just exceeding tip of abdomen; additional features obscured.

Legs: Long, single sub-apical spine on all tibia; all legs with five tarsomeres, with the basal tarsomere the longest; mesocoxa inserted at or anterior to midline of mesopleuron; claws simple; arolia extended.

Metasoma: Cerci advanced anteriorly; broad triangular-shaped ovipositor exposed at tip.

Measurements. Length body, 2.3 mm; length head, 0.4 mm; length compound eye, 328 µm; length thorax, 0.9 mm; length abdomen,1.1mm; length forewing, 1.4 mm; length antenna, 1.0 mm; length mesotibial spine, 180 µm; length metatarsomere 1, 220 µm; length metatarsomere 2, 126 µm; length metatarsomere 3, 100 µm; length metatarsomere 4, 80 µm; length metatarsomere 5, 120 µm; width abdomen 660 µm; length ovipositor, 290 µm.

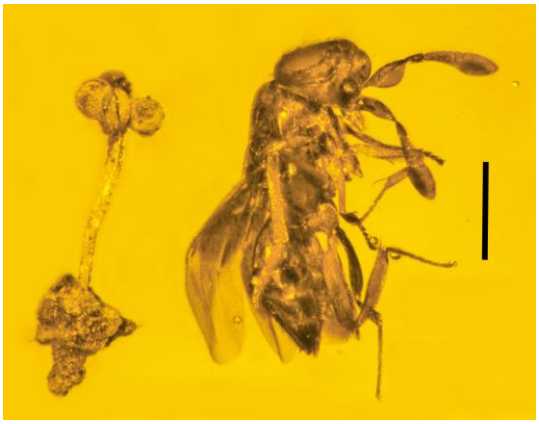

Figure 1. Right lateral view of *Hambletonia dominicana* in Dominican amber adjacent to a fragment of an angiosperm. Scale bar = 0.7 mm.

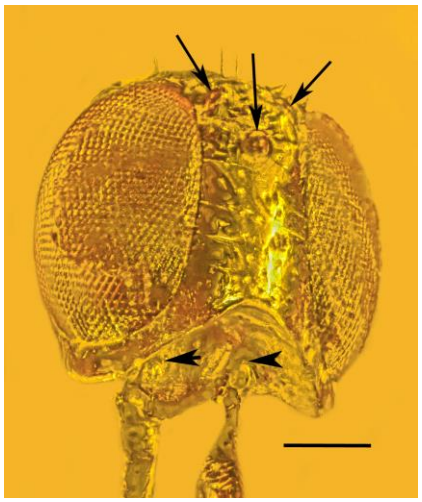

Figure 2. Face of *Hambletonia dominicana* in Dominican amber. Arrows show ocelli. Arrowheads show position of toruli. Scale bar = 0.1 mm.

Figure 3. Left lateral view of *Hambletonia dominicana* in Dominican amber. Arrows show ocelli. Scale bar = 0.2 mm.

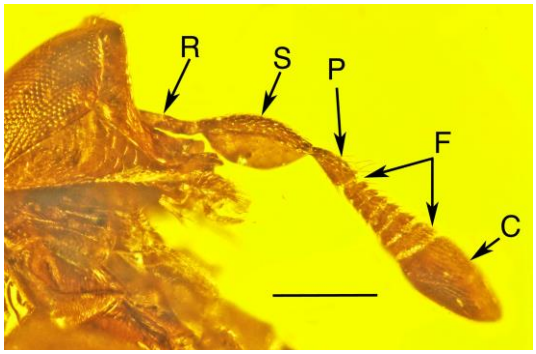

Figure 4. Left antenna of *Hambletonia dominicana* in Dominican amber showing radicle (R), scape (S), pedicel (P), funicle (F) and club (C). Scale bar = 0.2 mm.

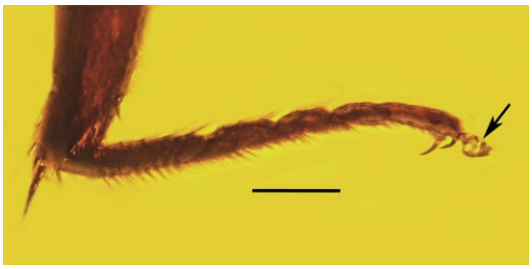

Figure 5. Lateral view of metatarsus of *Hambletonia dominicana* in Dominican amber. Note extended arolium (arrow). Scale bar = 0.1 mm.

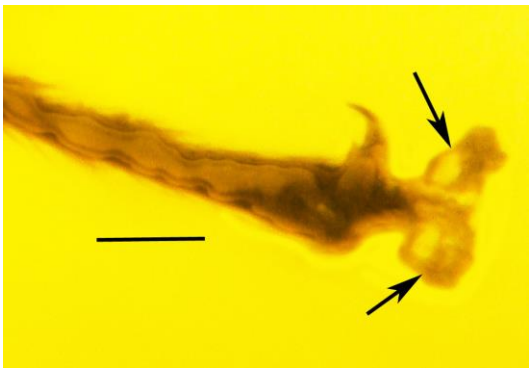

Figure 6. Ventral view of extended arolium (arrows) on terminal metatarsomere of *Hambletonia dominicana* in Dominican amber. Scale bar = 0.2 mm.

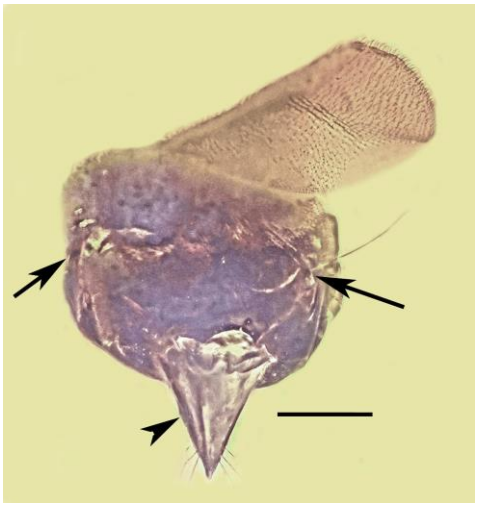

Figure 7. Posterior view of *Hambletonia dominicana* in Dominican amber showing cerci (arrows), ovipositor (arrowhead) and microsetae on wing margin and membrane. Scale bar = 0.2 mm.

Comments: In the key to known female species of *Hambletonia* spp. provided by Sharkov & Woolley (1997), *H. dominicana* is eliminated at

the first couplet since it does not have ocelli situated on a prominence and the pedicel lacks a tuft of elongated hairs on the dorsal side.

Discussion

The plant fragment adjacent to *H. dominicana* has not been identified but could have served as a source of nectar for the wasp or as a place for oviposition if the plant was a host for mealybugs that *H. dominicana* was parasitizing.

The large flattened scape, which is a feature of members of this genus, probably received the folded flagellum against it and then both segments were inserted into the cavity on the frons. This action would protect the antenna from ants that often defend the mealybug from parasitoids. Mealybug secretions are very nutritious and are used by ants to feed their young.

This is the first described fossil *Hambletonia* from Dominican amber. It provides views of new and possible unique morphological features of encyrtid wasps that existed in the Neotropics during the Tertiary.

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References

Clausen, C. P. (1962). *Entomophagous insects*. New York: Hefner Publishing Company.

Compere, H. (1936). A new genus and species of Encyrtidae parasitic in the Pineapple Mealybug, *Pseudococcus brevipes* (Ckll.). *Proceedings of the Hawaiian Entomological Society 9*, 171-174.

Goulet, H., & Huber, J. T. (1993). *Hymenoptera of the world: an identification guide to families.* Research Branch, Agriculture Canada, Ottawa, 1894/E, 668 pp.

Iturralde-Vinent, M. A., & MacPhee, R. D. E. (1996). Age and paleogeographical origin of Dominican amber. *Science*, *273*(5283), 1850-1852. https://doi.org/10.1126/science.273.5283.1850

Iturralde-Vinent, M.A., & MacPhee, R.D.E. (2019). Remarks on the age of Dominican amber. *Palaeoentomology 2*(3), 236- 240. https://doi.org/10.11646/palaeoentomology.2.3.7

Noyes, J. S. (2000). Encyrtidae of Costa Rica (Hymenoptera: Chalcidoidea), 1. The subfamily Tetracneminae, parasitoids of mealybugs (Homoptera: Pseudococcidae). *Memoirs of the American Entomological Institute*, *62*(36), 95-97.

Poinar, G.O. Jr. & Poinar, R. (1999). *The Amber Forest.* Princeton, NJ: Princeton University Press.

Poinar, G.O. Jr. (1991). *Hymenaea protera* sp.n. (Leguminosae: Caesalpinoideae) from Dominican amber has African affinities. *Experientia*, *47*(10),1075-1082. https://doi.org/10.1007/BF01923347

Schlee D. (1990). Das Bernstein-Kabinett. *Stuttgart Beitrage für Naturkunde (C). 28*,1-100.

Sharkov, A. & Woolley, J. B. (1997). A revision of the genus *Hambletonia* Compere (Hymenoptera: Encyrtidae). *Journal of Hymenoptera Research*, *6*(2), 191-218.

Trjapitzin, V.A. (1977). Characteristic traits of morphology of adult encyrtids (Hymenoptera, Chalcidoidea, Encyrtidae) and their systematic significance. *Trudy Vsesoiuznoe entomologicheskoe obshchestvo. 58*, 145-199.