Insect remains from Upper Triassic sediments of Satpura Basin, India

This note communicates the first occurrence of three different fossilized microscopic wingless parasitic insects as well as a few fragmented parts of cuticle of different insects along with setae of various lengths (only one fragment which does not belong to these three insects is shown here). The complete insect (Figure 1 a) and cuticle of a different insect (Figure 1 d) have been recorded from the matrix (yellowish-reddish sandy clay) of overlying Bagra Conglomerates exposed at Khatama caves (30°19'; 77°45') Hoshangabad district, Madhya Pradesh (MP) (Figures 2, 3). Two complete insects (Figure 1 b, c) have been recorded from the subsurface clay bands exposed in an artesian well-cutting at the village Anhoni (22°38'; 78°21') in Chhindwara district, MP (Figures 4, 5). The Denwa Formation (underlying) and Bagra Formation (overlying) are the highest units of the Mahadeva Group. The former, based on the occurrence of labyrinthodont fossil Mastodonsaurus indicus Lydekker, 1885 from Denwa beds near Jhira, was assigned to Late Triassic age (Keuper). However, Krishnan considered the presence of M. indicus (allied to Capitosaurus and Metapros) indicative of a Rhaetic age. He viewed upon the age of Denwa beds and Bagra conglomerates as Muschelkalk to Keuper and Rhaetic or/Rhaetic – Lias, respectively. It is suggested that upper part of Lower Triassic to Middle Triassic age for Denwa Formation and Rhaetic for Bagra, palynotologically, assigned Carnian to Norian age for Denwa Formation. From the Denwa/Bagra sediments, spore/pollen, dinocysts, fungal remains, trachids, etc. have also been recorded and assigned, palynotologically, the Denwa Formation Norian to Rhaetic in age.

The generalized sequence (as given in ref. 4) is summarized in Table 1 (in part).

The insect (Figure 1 e) and cuticle (Figure 1 d) have been recorded from matrix of Bagra conglomerates (Sample 1) exposed in the Zamani Nala (Figures 2, 3) near Khatama caves. The Bagra conglomerates have been formed from different kinds of rounded boulders of quartzites, banded jaspers, jasperoid conglomerate, which are loosely cemented by argillaceous matrix (yellowish to reddish sandy clay). The insects (Figure 1 b, c) have been recovered from the Denwa clays (Sample 7) from a well-cutting section at the village Anhoni (Figures 4, 5). Denwa clays are always calcareous and often contain numerous calcite nodules. They vary in colour between white and green, red and

Figure 1. a, Complete male fossil insect showing three parts of dorso-ventrally flattened bodyhead (A), thorax (B) and abdomen (C), saw-like mouthpart (D), cone-shaped mouthpart (E), genitalia (F), sclerotized part (G), branched setae (H), on body (230 µm long, 105 µm broad). BSIP SL no. 12501 (stage coordinates 15 X 99); A, Insect having pear-shaped body showing head and thorax fused to form cephalothorax (A) and abdomen (B) with setae (C) (88 µm long and 60 µm broad). BSIP SL no. 12053 (SC 17 X 99.5); c, Insect having rounded body (43 µm long and 38 µm broad), showing head and thorax fused to form cephalothorax (A) and abdomen (B) with setae (C). BSIP SL no. 12054 (SC 28 X 94.5); d, Fragmented part of cuticle of an insect showing long (80 µm) and elongate (160 µm) setae with their sockets, and three sockets (14–22 µm) without setae. BSIP SL no. 12052 (SC 23 X 103.5).
buff. The red ones are the most characteristic. Denwa sandstones are softer and less important. Red Jasper pebbles are common.

The complete insect (Figure 1 a), is dorso-ventrally flattened, comprising three parts of a typical insect — head (A) prognathus type, thorax (B) and abdomen (C). Its mouth parts are eight in number which are saw-like (D) and cone-shaped (E), to bite and sometime nibble the skin of host. It also shows the presence of external genitalia (F) in the terminal part of the abdomen. Some of its sclerotized part (G) is extended which confirms that this specimen is a male insect. The whole body is mostly decorated with branched setae (H), brownish pigmented.

Locus typicus — Khatama caves, Hosmandabad District, MP.

Stratum typicum — Bagra Formation, Mahadeva Group, Satpura Basin, MP, BSIP, Slide no. 12051.

The insects in Figure 1 b, c have a pear-shaped, and rounded-body, respectively, covered with simple setae of various lengths (C). These specimens may be ectoparasitic form on animals, because the presence of different lengths of setae provide them protection from predators. The body is divided into two parts, head and thorax are fused to form a small cephalothorax (A) and the remaining larger part is the abdomen (B).

Locus typicus — Anboni village, Chhindwara district, MP.

Stratum typicum — Denwa Formation, Mahadeva Group, Satpura Basin, MP, BSIP, Slide no. 12053 (Figure 1 b), 12054 (Figure 1 c).

Figure 1 d is a fragmented part of a cuticle of another insect having simple long (80 μm) to elongate setae (160 μm) with well-defined sockets (12–22 μm). The surface of the cuticle is slightly structured or sculptured.

Locus typicus — Khatama caves, Hosmandabad district, MP.

Stratum typicum — Bagra Formation, Mahadeva Group, Satpura Basin, MP, BSIP, Slide no. 12052.

Fossil lice are not known so far, but the present complete insect seems to be a fossil of mallophagan type of lice as it shows prognathus type of conical head, arrangement of setae on the body (chaetotaxy), pigmentation pattern and shape of male genitalia of mallophagan type ectoparasites. Mason and Mar-

Figure 2. Geological map of the area showing location of the rock samples near Khatama caves. (after Croookshank).

Figure 3. Stratigraphical sequence exposed in Zamani Nala near Khatama caves, Hosmandabad district, MP.
shall pointed out that bones of early mammals were present during the early days of Mesozoic era, i.e. about 200 m.y. ago (Late Triassic). Datta and Das have recorded the oldest mammalian fossil tooth from Tiki Formation (Late Triassic) of South Rewa Gondwana Basin, MP, India, which is neighbouring Satpura Basin. So, it must have connections with wandering mammals and it is presumed to be of same age group.

These citations show that the present fossil insects might have evolved during Late Triassic having ectoparasitic habitats on mammals.


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