

Blister beetle triungulins on carpenter bee at Gir National Park, Gujarat, India

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During one of our Nature camps (Batheshwar camp) on 4th Feb 2019 at Gir National Park, we observed and photographed a Carpenter bee (*Xylocopa latipes*) with a parasite hitchhiking the host bee. The phenomenon of phoresy was recorded at location 21°01'14.3"N 70°46'28.2"E during 8:30 am, the site adjoining Singodha Dam. The note reports the first record of the host-parasite relationship between the Carpenter bee and Blister beetle from Gir National Park, Gujarat, India.

Carpenter bees belonging to the genus *Xylocopa*, include 500 species under 31 subgenera (Minckley, 1998), among which 29 species were found in India (Ascher and Pickering, 2016). Carpenter bees, in comparison to honey bees, are more versatile agriculture pollinators due to their capability to buzz pollinate, high thermoregulation abilities, and crepuscular and nocturnal habits. (Heinrich and Buchmann, 1986; Keasar, 2010). Many natural flora and agricultural crops benefit from the pollination of *Xylocopa* species. (Gerling *et al.* 1989; Raju and Rao, 2006; Keasar, 2010).

Amongst Arthropods phoresy is common, where one organism with limited mobility and in hostile habitat is effectively transported by another organism (Saul and Millar, 2006). The first-instar larvae of the beetle or triungulin use the complex survival mechanism of Phoresy, culminating in the

transportation of parasites to the host nest (Saul and Millar, 2006). Hafernik and Saul-Gershenz (2000) first reported the Carpenter bee and Blister beetle-triungulin host-parasitic relationship, where the larval aggregations of blister beetle parasitize the bee. The larval form of blister beetle also called Triungulins (tri-ungulae or 3 claws) have adapted claws to grasp the host such as *Xylocopa* sp. The triungulins aggregate and hold vegetation while simultaneously exploiting the sexual communication system or chemosensory signals of bees by mimicking the sex pheromones of female bees. The luring male bees are attracted by the aggregations of triungulins, and upon contact (pseudocopulation) the triungulins attach to the male bees (Phoresis). Transfer from male to female occur during real mating, which is then subsequently carried away to nest by females. The *Xylocopa* sp. make tunnels for nesting in solid wood, stumps, logs, or dead branches of trees (Raju and Rao, 2006). The triungulins then consume grubs and pupae of host species.

Only a single bee was observed from the site. As per the direct observation, we were able to see the pale yellowish color, long smooth brush-like hairs, and light color on legs, confirming its sex as male. Through photographs, one can count more than 70 triungulin parasites. The bee was observed dull and uncomfortable compared to its usual active phase. The carrying capacity of the host is important for its survival and



Fig. 1 Snapshots of carpenter bee (*Xylocopa latipes*) parasitized by blister beetle triungulins

parasite survival (Sathe and Margaj, 2001; Vinson, 1976). Suitable parasitic load is an essential factor for the successful transportation of triungulins (Gophane *et al.* 2015). By parasitizing *Xylocopa* sp., triungulins acts as a limiting factor for pollination services (Saul and Millar, 2006).

Many species of the family Apidae which have been reported with host-parasite relation. Further studies and observation are required to understand the intricacies of host-parasite relation and the impact it creates on the ecosystem.

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