SUMMARY AND CONCLUSIONS
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The study was carried out in the villages of erstwhile Koraput district (Jeypore hills), the type locality of *An. jeyporiensis* and where natural infections with oocysts were recorded during the pre DDT period. The Koraput district has been highly endemic for *P. falciparum* malaria. The main focus of the study was to define the role of *An. jeyporiensis* in the transmission of malaria parasites.

Abundance of *An. jeyporiensis* immatures was assessed in various types of habitats available in the study area viz., streams, terraced paddy fields, rivers and ponds. Immature abundance was higher in terraced paddy fields followed by streams, which had perceptible flow of water. High dissolved oxygen content was found to be one of the factors that favoured the development of immatures of this species in streams. The immature abundance was higher in sites where the speed of water flow was less than 30 m per minute. Water speed above 30 m per minute caused flushing away of immatures. *An. jeyporiensis* larvae did not show any preference either to shad or sunlight. The species was observed to exist in close association with *An. fluviatilis*, the major malaria vector, in all the major habitats.

The adult population of *An. jeyporiensis* showed a seasonal fluctuation, with markedly higher abundance during dry cooler months (October - April), suggestive of a post monsoon species. The abundance was at the lowest level during rainy months (June - August). Net
reproductive rate as well as finite rate of increase were lesser than 1 during hot and rainy seasons, as a result of cumulative effect of lower survival rate of immatures and adults, indicating that the season with heavy rainfall was unfavourable to *An. jeyporiensis*. In Koraput district, the malaria incidence showed two distinct seasonal peaks, one during rainy season (July to September) and the other during cold season (November to December). Both the immature and adult populations of *An. jeyporiensis* were very low during rainy season, vis a vis the involvement of the species in malaria transmission during this season is not likely. However, the abundance of this species peaked in cold season, which coincided with the rise in malaria incidence in this area.

Spatial distribution of *An. jeyporiensis* in the four physiographic zones of the district was studied. *An. jeyporiensis* was relatively more abundant at higher altitudes (+900 m MSL) where climate is cool and perennial streams and terraced paddy fields are common.

In the past, *An. jeyporiensis* was regarded as a proven indoor rester. But, in the present study exophilic behaviour of the species was established. The species was found to rest both indoors as well as outdoors and its preference to habitats for resting varied with the season. In Koraput zone, it preferred to rest indoors during cold and rainy season and showed no marked preference either to indoors or outdoors during hot season. In Rayagada zone, the species preferred to rest outdoors during hot season. Whereas in cold and rainy seasons, this species had no special preference either to indoors or outdoors. Earth lined box shelters were found to be the
most efficient device to sample the population resting outdoors.

Light traps could be used as an alternate sampling method for monitoring *An. jeyporiensis* population. As fully fed mosquitoes could be caught alive, light traps could also be used for insecticide susceptibility tests and for blood meal identification.

Abundance of diurnal indoor resting population of *An. jeyporiensis* recorded in villages of Rayagada zone, was six times lower than that reported during the pre DDT period. Biting was observed only in cold months when relative abundance was higher. The human biting abundance of *An. jeyporiensis* (0.42 per man per night) was 24 times lesser than that of *An. fluviatilis* (10.25). Overall, the reduction in abundance of this species over years is thought to be one of the reasons for such a low man vector contact.

Anthropophilic index of *An. jeyporiensis* was 13 times lower than that recorded in the same area during the pre DDT period, indicating a poor man feeding habit. The index was also too low to compare with that of *An. fluviatilis*.

*An. jeyporiensis* showed no definite preference to indoor or outdoor for feeding. Although, feeding indoors was common, outdoor feeding was also noticed whenever the hosts were available.
Mean generation time was longer in cold season, due to low temperature. However, net reproduction rate and finite rate of increase were relatively higher during this season, resulting in population rise at a rate of 1.02 per female. The main contributory factor to this increase was the survival rate of adults. The pattern of natural increase reflected the predicted seasonal trend.

The maximum longevity attained by *An. jeyporiensis* during rainy and cold seasons was 16 days, which was not sufficient for the completion of sporogonic period. During cold season, the mean temperature ranged from 14.3 °C to 22.0°C (mean=18.1°C) and the adults have to survive for a minimum of 20 to 24 days to complete the sporogonic period. Therefore, the role of *An. jeyporiensis* in transmission of malaria parasites during cold season could also be ruled out.

The estimated values of vectorial capacity of *An. jeyporiensis* were 315 times lower for *P. falciparum* than that of *An. fluviatilis*, 263 times lower than that of *An. culicifacies* and 236 times lower than that of *An. annularis* estimated earlier in this hill tracts (Parida et al., 1991). The poor man feeding habit of *An. jeyporiensis* was the contributing factor for its poor vectorial capacity.

In experimental feedings, *An. jeyporiensis* developed both oocysts and sporozoites suggesting the physiological ability of this species to acquire the infection and mature the malaria parasites. However, dissections of 4550 wild caught females of *An. jeyporiensis* from Koraput zone and 379 females from Rayagada zone, none was found infected with malarial
parasites, though in the distant past, oocyst infections were noticed in this species in the same area. It is, therefore, concluded that *An. jeyporiensis* do not play any role in transmission of human malarial parasites in Jeypore hill tracts, mainly because of its lower man biting abundance, poor man feeding habit and shorter longevity.