quality and in an appropriate amount so that it does not waste. If the plants produce too little food, the insects will search for easily accessible alternative sources of food. It is also important that there should be synchronization between the timing of insect visits to the plants and the availability of food, and the plant species must be easily recognized by an insect. It is equally important that the plants with numerous flowers blooming at the same time secrete small amounts of nectar and pollen to ensure that the insects must visit several plants to satisfy their needs.

Among orchids, roughly half of the plant species do not produce nectar, but they adopt other strategies like deception by mimicry to attract insects. In such cases, the flowers may resemble other nectar-producing flowers or look like female insects to attract male insects for pseudocopulation. There is a spectrum of intimacy between plants and their insect pollinators. On the one hand, this plant–insect relationship is not specific, where a large variety of insect species may act as pollinators for a large number of plant species. In such cases, the plants or insects have no morphological or physiological modification. On the other hand, this relationship is highly specific, where a plant species is only pollinated by a particular insect species. In this case, the morphological features of insect pollinators are complementary to the flower morphology; the life history and diurnal activity of the insects are in perfect synchronization with the blooming period of the plants, and lastly, nectar is secreted in the right quantity and quality to fulfil the requirements of the insects.

A special and typical insect–plant mutualism is exhibited by harvester ants that use plant seeds as food. These ants play an important role in dispersing seeds when they are accidentally lost, as these ants carry them on their backs to the nest, or the seeds may germinate when the ants do not consume them. The myrmecochorous plants, found in Australia and South Africa, produce a special kind of attractive appendages known as elaiosomes on their seeds, which secrete chemicals that induce ants to transport them without causing any damage to the seeds. The elaiosomes are rich in starch, lipids and other valuable nutrients and serve as delicious food for ants, whereas the seeds are discarded. Thus, these ants play a vital role in the dispersal of seeds. This highly sophisticated and advanced degree of mutualistic relationship is known as myrmecochory.

KRISHNA KUMAR

Department of Zoology,
Faculty of Science,
University of Allahabad,
Prayagraj 211 002, India
e-mail: kkumaruniv@rediffmail.com

Cyril Cedric Dover (1904–61) – a forgotten entomologist, zoologist and anthropologist of India

Subba Rao's *History of Entomology in India*[1] is a widely consulted book that chronicles insect studies and the evolution of entomology in India from the ancient past until the end of the 20th century. On pages 91–124, captioned 'Entomology in India between 1900 and 1950', Subba Rao speaks of many Indian entomologists and a handful of foreign entomologists who worked on Indian insects. He does not mention Cyril Cedric Dover (Figure 1) in his book. Dover impresses as a notable personality in entomology, biology and anthropology in India and elsewhere. Since innumerable notices[2], articles[3] and books[4,5] speak of Dover, I have preferred to write this as a brief note to remind ourselves of this unsung hero of Indian entomology and biology.

Dover was of Anglo-Indian ancestry, born to Percy and Sophy Dover in Calcutta on 11 April 1904. He is indicated as a descendant of James Skinner (1778–1841), who retired as a Colonel after serving in the Maratha Army first and the Bengal Army later. The Dover chroniclers indicate that he was fascinated by animals and their lives from an early age. Some indicate that he dropped out of medical education at Calcutta Medical College and joined the Indian Museum at Calcutta as a gallery assistant. The reasons for this turn of events in his life are unclear. During his work days at the Indian Museum, Dover came under the personal tutelage of Thomas Nelson Annandale, the Founder and first Director of the Zoological Survey of India (ZSI) in Calcutta (established in 1916). At 18, Dover published his first scientific paper on the Vespidae (Hymenoptera)[6], along with H. Srinivasa Rao (Assistant Superintendent, ZSI, Calcutta). In 1923, at 19, he published a booklet, *The Common Butterflies of India: An Introduction to the Study of Butterflies, and how to Collect and Preserve them*, details of which are not traceable. Annandale enabled Dover to secure a scholarship to study zoology and botany at the University of Edinburgh. On his return from Scotland, Annandale employed Dover at ZSI as an entomologist while remaining affiliated with the Asiatic Society of Bengal, Calcutta.

Figure 1. Cyril Cedric Dover (Photo credit: Anu Kumar, https://scroll.in/global/985750/).

Dover's entomological interests were indefatigable. He wrote some of his papers jointly with his first wife, Mercia Heynes-Wood, also a zoologist–entomologist. Appendix 1 gives a sample list of Dover's entomological papers. He also wrote papers on the Crustacea *Parabathynella malaya* (Parabathynellidae). Dover maintained an extensive personal collection of aquatic insects; he studied the spike disease of sandalwood trees and examined ways to preserve wood from termite attacks. He maintained a lifelong love for trees. While working at the Army School of Hygiene (Keogh Barracks at Mytchett, near Surrey,

Appendix 1. An incomplete list of papers by C. C. Dover

Dover, C., The occurrence of *Bombus* in the Indian plains. *Nature*, 1921, **107**(2690), 362.
Dover, C., A note on bees of the genera *Xylocopa* and *Bombus* in the Indian Museum. *Rec. Ind. Mus*., 1922, **24**, 85–89.
Dover, C., XXV. Notes on some Indian bees in the British Museum. *Ann. Mag. Nat. Hist.*, 1925, **15**, 219–234.
Dover, C., Notes on a collection of aquatic Rhynchota from the Buitenzorg Museum. *Treubia*, 1928, **10**, 65–72.
Dover, C., Wasps and bees in the Raffles Museum, Singapore. *Bull. Raff. Mus.*, 1929, **2**, 43–73.
Dover, C., Aquaria for rearing minute organisms requiring running water. *Nature*, 1929, **124**(3122), 336.
Dover, C. (ed.), Fauna of the Batu Caves, Selangor. *J. Fed. Malay States Mus.*, 1929, **14**, 325–387.
Dover, C., An improved citronella mosquito deterrent. *Indian J. Med. Res.*, 1930, **17**, 961.
Dover, C., The story of a 'living fossil': *Parabathynella malaya* Sars*., Nytt Mag. Zool*. (*Særtrykk av Nytt Magasin for Zoologi)* (Zoological Museum, Oslo), 1953, **1**, 87–97.
Dover, C., *Half Caste*, Martin Secker & Warburg Limited, London, 1937, p. 314.
Dover, C., *Know this of Race,* Martin Secker & Warburg Limited, London, 1939, p. 107.
Dover, C., *Hell in the Sunshine,* Martin Secker & Warburg Limited, London, 1943, p. 297.
Dover, C., The classification of man. *Curr. Sci*., 1952, **21**, 209–213.
Dover, C., *American Negro Art*, New York Graphic Society, New York, 1960, p. 214.

UK), Dover developed a mosquito repellent (citronella oil in Vaseline) known as 'Dover's cream'[7], which was widely used in the African theatre during World War II.

Dover has written extensively on diverse aspects of zoology, including entomology. In 1934, his interest shifted towards human races and anthropology (Appendix 1). Notably, Annandale – his early mentor – was a trained anthropologist, so his interest in shifting into anthropology does not surprise me. According to blogger Anu Kumar, 'An entomologist, a writer and poet, and an activist for coloured solidarities, Cedric Dover was a man of many parts' (https://scroll.in/global/985750/remembering-the-anglo-indian-who-fought-for-people-of-colour-and-came-to-the-rescue-of-wwii-soldiers; accessed on 14 December 2023), which is resoundingly true.

1. Subba Rao, B. R., *History of Entomology in India*, Dr M. Puttarudraiah Memorial Endowment Institution of Agricultural Technologists, Bangalore, 1998, p. 168 with several unnumbered pages of photo plates.
2. Christie, A., *Man*, 1962, **62**, 55.
3. Banton, M., In *The Wiley–Blackwell Encyclopaedia of Race, Ethnicity, and Nationalism* (eds Stone, J. *et al.*), Wiley–Blackwell, Hobocken, NJ, USA, 2016; https://doi.org/10.1002/9781118663202.wberen325 (accessed on 14 December 2023).
4. Slate, N., *The Prism of Race: W. E. B. Du Bois, Langston Hughes, Paul Robeson, and the Colored World of Cedric Dover*, Palgrave Macmillan, New York, USA, 2014, p. 269.
5. Wright, P., *Passport to Peking, a very British Mission to Mao's China*, Oxford University Press, Oxford, UK, 2010, p. 591.
6. Dover, C. and Rao, H. S., *J. Asiat. Soc. Beng.* (*N. S.*), 1922, **18**, 235–249.
7. Dover, C., *Indian J. Med. Res*., 1930, **17**, 961.

ANANTANARAYANAN RAMAN

CSIRO, Floreat Park,
WA 6014, Australia and
Charles Sturt University,
PO Box 883, Orange,
NSW 2800, Australia
e-mail: Anantanarayanan.Raman@csiro.au