

In Memoriam

Scale insects (Hemiptera: Coccoidea) described by James Anderson M. D. of Madras

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In a series of letters to Sir Joseph Banks published in 1787 and 1788, James Anderson described one new genus and eight new species of scale insects, seven of which he placed in the genus *Coccus* L. Because of the lack of original material and only the flimsiest evidence from Anderson's short descriptions, the true identity of the species may never be known. The purpose of this work is to delve into Anderson's letters and descriptions and to consider if any of the species can be assigned to a scale insect family. The descriptions were spread among the letters and most species were named in the 13th and 14th letters. It is hoped also that this paper may form a basis for a complete bibliography of Anderson's publications to be compiled by the present author at a later date.

James Anderson M. D. was born near Edinburgh on 17 January 1738 and died on 6 August 1809. He went out to India as Surgeon on an East India Company ship in 1759 and again in 1761. In 1762 he was sent to Manila and held a commission as surgeon in the army as well as in the Company's service. Anderson returned to India and became assistant surgeon in 1765, surgeon in 1786 and later Physician-General to the East India Company at Madras, Fort St. George, a fort built in the previous century (Anderson L. L. D., 1800; Anon., 1810; Stephen, 1885; Crawford, 1914; Sweet, 1972).

His friend and contemporary was James Anderson L. L. D., who remained in Scotland before eventually moving to London. His publications are sometimes listed erroneously with those of James Anderson M. D. and, to distinguish between both men, they are usually referred to with their respective professional awards.

When at Fort St George, Anderson spent much of his time trying to improve and promote industries to the benefit of the Company and to the comfort and happiness of the local population. The culture of cochineal seems to have become an obsession. At first, Anderson had a strange notion that the colour of insects was affected by the nature of their food (Anderson, 1787a). By feeding local 'cochineal' insects on cactus, already growing in Madras, he hoped to obtain cochineal dye. His term 'cochineal insects' needs some

explanation. In his letter No. 5 (Anderson, 1787a), Anderson stated that he used 'the cochineal in all his letters as it is understood by the Spaniards, in a general sense.' In English, the name cochineal insect is normally applied to a species that produces cochineal dye. In Spanish, the word 'cochinillas' (equivalent to the French word 'cochenilles') refers to the entire group, known in English as scale insects.

Anderson sent some scale insects that he had collected on grass, and the dye they produced, to Sir Joseph Banks for his inspection and it was these that probably led Banks to describe as 'imaginary cochineal of Madras' (D. T. C. (no date) 7: 113-115; Anderson, 1791). The young of the insects on the grass, according to Anderson, did not survive for more than 8 days on his *Opuntia* plants but some of his other species of 'cochineal' insects, the polyphagous species, did thrive on cactus.

Cochineal dye is produced from 'cochineal' insects of the genus *Dactylopius* Costa; nine species are known according to De Lotto (1974) and Perez Guerra & Kosztarab (1992). All originate in the New World and feed on species of cacti, many in the genus *Opuntia*. Four species are known to occur in Mexico and, in Anderson's time, cochineal was produced in Mexico from the insect now known as *Dactylopius coccus* Costa (the cochineal insect of commerce). The production and sale of cochineal were entirely controlled by Spain and, by imposing repeated duties on the exportation of cochineal, the price was excessive. It was known that a more inferior cochineal could be produced from some of the other species and, in Mexico, where cochineal insects fed on cactus grown in special fields or plots known as nopalries, the plants could become contaminated with one or more of the other species.

In correspondence from East India House in London to Fort St George (Anderson, 1789), it was decided that the soil and climate of the coast of Coromandel sufficiently resembled those of Mexico. Anderson was given permission to start a nopalry. Through the influence of Sir Joseph Banks, cactus plants were sent from the Royal Botanical Gardens at Kew. Some were also kept aside specially at the Cape of

Good Hope, St Helena, Bombay and Calcutta so that, if any cochineal insects should be procured from Mexico, they could be placed on the plants in case they did not survive the long journey.

Cochineal insects were eventually collected with cactus plants in Brazil by Captain Nielson who left some at the Cape (Anderson, 1795a). He also sent some to St Helena and Bombay and delivered others to the Botanical Garden in Calcutta under the care of Dr. William Roxburgh who reported that they could thrive on the local cactus. Some plants and cochineal insects were sent later from Calcutta to Madras where they became established. In a letter from Andrew Berry, Superintendent of the nopalry, Anderson (1795b) reported the dyeing of some cloth. Berry also reported that 'As the insects became shrivelled and hard, I rubbed them gently between my hands so as to detach the coverings, and having them winnowed as the natives do their rice to separate the husk, all impurities were got rid of'. In a later letter, however, Anderson (1796) stated that the Madras cochineal required double the quantity to produce the same effect as the Mexican insect. The true cochineal insect, *Dactylopius coccus*, was never introduced to Madras during Anderson's time and the species he received from Brazil was probably *D. ceylonicus* Green, which is still common in India but originated in South America. Unlike *D. coccus*, this species produces a dense covering of white mealy wax and it was probably this that Berry was rubbing off his hands.

To many students of scale insects, until recently Anderson was best known for a species of *Coccus* L., later transferred to *Ceroplastes* Gray, as *Ceroplastes ceriferus* (Anderson), which he never described. Anderson had studied this scale insect in Madras, stating in a letter (Anderson, 1790), that he had found nests of insects resembling cowry shells on *Staphylaea vepretum* and that he had made a hard wax from the covering of the insects. In a letter to Anderson (Anderson, 1791), Banks wrote on favourable terms about the insect which he took to be a species of *Coccus*. Although this insect was described by Fabricius in 1798, it has often been credited to Anderson in a reference *Monographia cocci ceriferi*, 1790. Remarkable research by De Lotto (1971) indicated that this work was never published but was first referred to by Virey (1821). The fictitious work was listed by Carus & Engelmann (1861) and by Hagen (1862) as being published in Madras in 1790 and, because of the authority of these famous works, it was often listed as such afterwards. The correct reference is quoted here as Anderson (1791).

All the scale insects discussed and described by Anderson are usually listed in a collective work of 14 letters pub-

lished by Anderson (1788b). These letters were actually published previously in eight separate parts, herein listed as Anderson (1787a-1787g, 1788a). According to Dawson (1958), they had been published earlier in *The Madras Courier* between February 1787 and January 1788. Anderson included the same plate containing 12 figures in each of his publications (Anderson, 1787a-1787g, 1788a, 1788b) and these figures, referred to by Anderson, are reproduced in Plate 1.

Caroline Whiteford and Norman Robson, Department of Botany, The Natural History Museum, London, have kindly supplied current acceptable names for all the host plants that Anderson associated with the discussions of the scale insect species.

(Reproduced in part from Williams, D.J., 2002. *J. Nat. Hist.*, 36 : 237-246).

Letters

I have read with interest the paper in your *Bionotes*, "A Checklist of the Roadside Trees of Kolkata City".

The authors have identified 104 species. There is no mention of the first ever study made by A. P. Benthall (1946) where he has listed 276 species. Later, Suchitra Ghosh (2010) in her study on Biodiversity of Kolkata listed 216 species of Trees. Ghosh A. K. et al. (2013) shared that 21% of species recorded in 1940 have disappeared.

The authors may consult the relevant literature: Benthall (1946); Ghosh, S. (2010), ZSI; Ghosh et al. (2013), ILLE 36 (2).

—Prof. (Dr) A. K. Ghosh
Director, Centre for Environment & Development,
Honorary President, ENDEV, Kolkata.

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Pl. find enclosed my recent publication of a book on Nayachar Island. It is: "Studies on the succession and Faunal Diversity and Ecosystem Dynamics in Nayachar Island, Indian Sunderban Delta." by A. K. Hazra, G. P. Mandal, M. K. Dey, A. K. Sanyal and A. K. Ghosh.

Its a result of 14 yrs. studies. This is first of its kind of research in India on growth & development from a barren island to a climax mangrove forest, with changes in faunal structure.

Once you also accompanied us to the Nayachar island. I want your valued review in any forthcoming issue of *Bionotes*.

—Dr. A. K. Hazra Ph.D., D.Sc, FZS (Cal.)
Emeritus Scientist,
Zoological Survey of India, Kolkata.