This study has helped in understanding how the efficiency of biting and feeding is increased in the land-leeches. Firstly, the distribution of denticles is such that the smallest denticles are situated on the outer peripheral end of a jaw, where microincision on the host-surface is initiated (figure 2). When a jaw is moved in a centrifugal manner, this small wound is slowly deepened with the help of larger denticles, found towards the central oral aperture; and widened with the help of the wedge-shaped jaws bearing a broad base and attenuated edge. Secondly, a typical denticle in the land-leech is considerably curved outwards, a fact seen neither in the Indian cattle-leech, *P. granulosa*, nor in the European leech, *H. medicinalis*. Lastly, the denticles are distinctly sharper and more acute-tipped than those of *P. granulosa*. The presence of such a denticular curvature and acute tip obviously adds to the sawing efficiency of the jaws of the land-leeches during microincision.

The present study, supported by light microscopic work, has shown that a large number of salivary ductules pass through a denticle and open at its tip. In addition to such an intra-denticular salivary discharge, a few openings can also be seen around the denticles. In short, a denticle not only pours saliva but is bathed by it also during microincision. A similar intra-denticular salivary discharge has been reported by Damas[2] in *H. medicinalis*.

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CHARACTERIZATION OF PURPLE AND GREEN PHOTOSYNTHETIC BACTERIA ISOLATED FROM THE LAGOON OF AGATTI ATOLL (LAKSHADWEEP SEA)

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PHOTOSYNTHETIC bacteria comprise green and purple bacteria which are different physiologically but with common anoxygenic photosynthesis using only one photosystem. They are different from cyanobacteria in that the latter group will carry out oxygenic photosynthesis using two photosystems[1]. The contribution of photosynthetic bacteria to primary production in some environments can be very high and it varies from 20 to 85% of the total daily production in some lakes. These bacteria are important not only as food for secondary production but also in the removal of toxic sulphide through anaerobic photooxidation in the process of CO_2 assimilation[2]. Not much information is available on these bacteria in tropical waters except one report on the photosynthetic non-sulphur bacteria of Rhodospirillaceae in India[3]. The present communication is the first of its kind to report the occurrence and characterization of photosynthetic sulphur bacteria in the tropical waters.

During the 147th cruise of R.V. *Gaveshani* (5–25, January, 1985) routine microbiological parameters were studied in some of the Lakshadweep islands. While working in Agatti Island (Lat. 11°50′N and Long. 72°11′E) extensive areas of pink coloured sediments were noticed in the lagoon. These were found with decaying beds of sea grass. Since red water phenomenon in marine environment due to bacteria has been studied, and described in many coastal lagoons and lakes[4–7], an attempt was made to isolate photosynthetic bacteria from the pink sediments and characterize them. Sediment samples were collected aseptically and about one gram of sample was added to screw capped culture tubes (25 ml cap) containing Pfenning's medium[8]. The tubes were incubated at room temperature (28 ± 2°C) for 7 days under natural

diffused sun light. One set of tubes was also supplemented with 0.5 g of sterile boiled egg per tube to test for photoorganotrophic Rhodospirillaceae. At the end of the incubation period, some tubes developed intense purple violet colouration and some others green. In addition, some tubes developed both purple and green colouration. Bacteria from these tubes were subcultured and subsequently purified by serial dilution on shake agar.

It was observed that identical types of purple bacteria developed both on organic and inorganic media. The development was, however, faster in the organic medium. The cells tended to grow in aggregates on the walls of the tubes. Microscopic examination of purple phototrophic bacteria from inorganic medium revealed that the cells were elongate (4–6 μm $\times$ 2–3 μm), motile, with sulphur granule inclusions. When the sulphide content of the culture medium was in excess, cells sometimes grew upto 8–10 μm $\times$ 3–4 μm size. Organic medium also yielded similar cells. Absorption spectrum of whole live cells suspended in 143% sucrose solution[9] taken in a BECKMAN-DU 6 scanning spectrophotometer showed that there were three peaks i.e. 805 nm, 830 nm and 863 nm in the infrared region and two peaks i.e. 450 nm and 590 nm in the visible region. The methanolic extracts of cells showed peaks at 365, 608 and 772 nm.

Green phototrophic bacteria consisted of non-motile spherical cells measuring 1–1.5 μm in diameter. Sometimes the cells were found in chains. The absorption spectrum of whole live cells suspended in sucrose solution showed marked peaks at 749, 486, 423 and 380 nm. The methanolic extracts of cells showed peaks at 666 and 435 nm.

When the characters of these cultures were compared with those of photosynthetic bacteria described by Truper and Pfennig[9], the purple bacteria could be identified as *Chromatium* spp. The spectral characteristics of the whole cells and their methanolic extracts prove that these strains contain bacteriochlorophyll 'a'. The peaks observed at 450 nm and 590 nm in the spectrum of whole cells could be attributed to the carotenoid pigments, most probably rhodopinal. The purple violet colour of cell suspension together with the spectral characters, cell size and ability for photoautotrophy permit them to be tentatively identified as *Chromatium violascens*.

The possibility of identifying the present strain as either *Chr. warmingii* or *Chr. buderi* which are also purple-violet in colour, is ruled out, because these species have larger cell size and because of their inability to utilize compounds other than acetate and pyruvate.

The phototrophic green bacteria could be identified as *Prosthecochloris* spp. The spectral characteristics of live cell suspensions and methanolic extracts show that they contain predominantly bacteriochlorophyll 'c'. The peaks at 486 and 423 nm could be attributed to the predominant acarotenoid, chlorobactene[9]. The strain isolated in the present study is different from the marine *Prosthecochloris* sp. described by Matheron[6] which exhibited maximum absorption at 460 nm and 750 nm in *in vivo* suspension and at 435 nm and 673 nm in methanolic extracts. The identity of the strain as *Prosthecochloris* is further supported by the fact that they formed consortia with sulphate reducing bacteria in the primary isolation tubes, which is a characteristic feature of this bacterium. With the available data, this strain could be identified as a variant of *Prosthecochloris aestuarii* which is the only green coloured species so far reported[9].

Experiments to estimate the contribution of these purple and green bacteria to primary production under photoorganotrophic and photoautotrophic conditions are under way.

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