limit imposed by the atomic character of substances giving rise to the sensation of smell; *i.e.*, whether the sensation of smell can be excited even when there be present a few molecules (or a single molecule?) of an intensely smelling substance. Any data that might be obtained in this connection are bound to be helpful in the study of the evolution of senses. It is intended to make some tests on this point and we shall be glad to receive information on data concerning this if already obtained.

D. V. GOGATE.
D. S. KOTHARI.

Physics Department,
University of Allahabad,
Allahabad,
*October 24, 1933.*

## A Gall-like Structure from a Tree in the Andamans.

WHILE on a visit to the small tidal creeks between the Cholunga range of hills on the west coast and the Sholl Bay creek on the east coast of South Andaman, I noticed a large number of these gall-like structures on the branches of *Carappa obovata* (Meliaceæ),[1] a medium-sized tree which appears to be a common element of the flora of the swampy banks of the small tidal creeks. The structures have a considerable range in size, the largest collected being over 24 inches in diameter (Fig. 1). The smaller ones are nearly spherical in shape while the larger ones are oblong or kidney-shaped. In colour and in form they resemble superficially the tubers of *Amorphophallus campanulatus*. These were at first mistaken for fruits of *Carappa obovata*, but on closer examination of the tree it was found that the gall-like structures were firmly attached to the branches by tiny roots issuing from the base of the former. Thousands of ants were found swarming on the surface making it difficult to collect the "galls". A vertical median section of the "gall" (Fig. 2) reveals

**Fig. 1**

One small and two large galls from *Carappa obovata*, both from the same tree.

Orchids and other epiphytic plants are also found on the same tree.

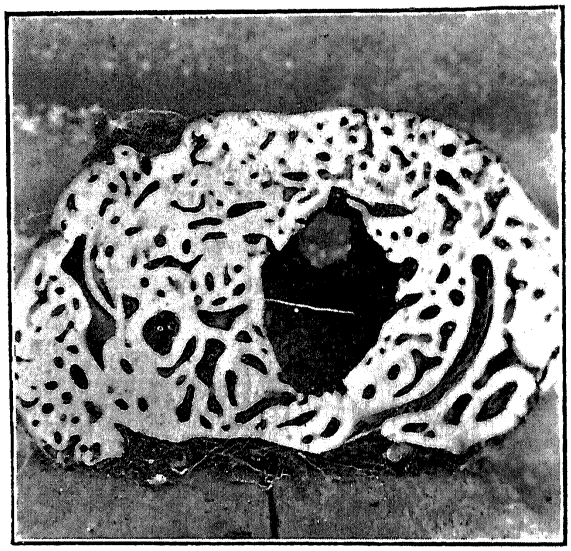

**Fig. 2**

Vertical median longitudinal section of one of the large galls showing the internal chambers.

a hollow space in the centre communicating with the outside by smaller apertures on the surface, and a number of more or less cylindrical passages which branch and anastomose to form a complex system of chambers resembling the interior of a termites' nest. The lining membrane of the chambers is of the same nature as that of the external surface of the "gall". The ants infesting the "gall" seem to breed and lay eggs inside the chambers. Mr. Durgadas Mukerjee of the Calcutta University who was kind enough to examine the ants has provisionally referred them to *Prenolepis bourbonica* Forel from which they differ in certain minor characters. He thinks, however, that they may prove to be a new race of *P. bourbonica*. The chambers are also inhabited by a few immature forms of

[1] I have to thank Mr. K. N. Ayyar, Extra Assistant Conservator of Forests, Port Blair, for identifying the plant.

other insects which are for the moment unidentifiable. The tissues of the "gall" are pith-like in consistency and are full of a watery secretion which seems to dry up very slowly; and it was found that the ants were alive and active for several days after the "galls" were removed from the tree.

It is difficult to say whether the structure described here is a true gall or not, and what the casual relationship of the ant to this structure may be. The presence of root-like structures on the undersurface of the "gall" inclines me to think that it may be an epiphyte like the orchids and other plants found in close association with it on the same tree, but the curious internal structure of the so-called gall appears to be unique. I hope to be able to collect more material with a view to further study.

H. SRINIVASA RAO.

Port Blair,
Andamans,
*November 2, 1933.*

---

## *Rhogas aligharensi* sp. n. (A Pink Boll-Worm Parasite).

GOING round the cotton-fields at Aligarh in order to study the Pink boll-worm parasites, a few parasitised larvæ of Pink boll-worm (*Platyedra gossypiella*) were collected. From these larvæ some Hymenopterous parasites of the Family Rhogadinæ emerged out. These were studied and sent out for identification. Prof. Dr. Bischoff of the Universitaet Giessen a.d. Lahn (Germany) very kindly took the trouble of identifying them. He gave them a rank of new species belonging to the genus Rhogas. After a careful study they revealed close resemblance to a boll-worm parasite described from Lyallpore as *Rhogas testaceus* (Grav). The life-history which is very imperfectly worked out at Lyallpore resembles broadly with that of this new parasite found at Aligarh. Differences, however, exist in the structure. The chief points of difference are:—

(1) The number of joints in the flagellum of *R. testaceus* are 31–32, whereas in this Rhogas sp. there are 33–34 joints in the flagellum.

(2) Scape in *R. testaceus* is of a deep yellow colour while it is yellowish brown in these parasites.

(3) Abdomen in *R. testaceus* is yellowish brown ventrally but in these specimens the posterior segments are deep dark brown, especially in females.

(4) The size of females in some specimens was bigger than in *R. testaceus*. The ovipositor is black in colour.

From the field-study it appears that there is an external check on these parasites. In a few cases it was found that out of parasitised host larvæ, adult parasites failed to develop.

The biology and complete life-history of this parasite is under preparation and it will be published elsewhere.

MOHD. AFZAL HUSAIN QADRI.

Zoological Laboratories,
Muslim University,
Aligarh, U.P,
*November 9, 1933.*

---

## On the Raman Frequencies of the $NH_4$-Group.

To explain the anomalous result observed in the Raman spectra of solutions of ammonium salts, in which the usual water band is found to be accompanied by another on the side of smaller frequency shift, we investigated the Raman spectra of a number of ammonium salts in the crystalline state and in the state of solution. It is found that the second band, wrongly attributed by some workers to water, is due to the $NH_4$ radical.

Microphotometric records of the spectra are taken to locate the position of the maxima in the $NH_4$ band. The following frequency shifts are obtained: $\delta\nu$=3117, 3169 (?), and 3220 $Cm^{-1}$. in the crystalline state; and $\delta\nu$=3157 and 3221 $Cm^{-1}$. in solution. These correspond to the infra-red absorption band found by Reinkober in ammonium salts at 3·20$\mu$. This band is attributed to the vibration of the N and H atoms parallel to the axis of symmetry in the pyramidal model of the molecule in which the N atom is situated at the vertex and the H atoms at the four corners of the base of the pyramid.

A detailed report of the investigation is communicated to the *Zeitschrift für Physik* for publication.

I. RAMAKRISHNA RAO.
C. SAMBASIVA RAO.

Andhra University,
Waltair,
*November 15, 1933.*