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NEWS

Chemical Abstracts in CD-ROM

The 12th Collective Index to *Chemical Abstracts* (12th CI) will be available in CD-ROM some time in 1993. Also available will be a companion CD-ROM product containing displayable bibliographic citations and abstracts for the 1987–1991 time period covered by the collective index. Both these items will be produced by Cambridge Scientific Abstracts, whose CD-ROM publishing division, Compact Cambridge, has so far published 18 databases.

The CD-ROM version of the collective index will contain all of the information found in the printed counterpart, with the exception of chemical structure diagrams. The access points will be similar to those in the printed index and will include author names, general subject terms, and chemical subject terms. However, the CD-ROM product, which is expected to occupy ten discs, will enable searchers to retrieve references much more quickly than from the 114 volumes of the printed index.

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CAS lowers connect-hour charges

Commencing 1 June 1992, the connect-hour charges for all Chemical Abstracts Service (CAS) files, except learning files, on STN International have been lowered to $29. Connect-hour charges for the learning files have already been reduced to $15.

CAS began a shift away from time-based charging in 1988, towards charging for the number of terms used in a search statement and answers displayed. The change in emphasis was aimed at adjusting search-term and time charges so that, allowing for the effect of system and file enhancements, the same searching patterns in CAS files on STN would yield a near-identical revenue to CAS.

As retrieval efficiency in online search depends largely on the structure and organization of the information content in the database, it is only proper that the price of an online search should reflect the value of the search to the user and not on the length of time the user is connected to the host computer, which can vary greatly according to the speed of the searcher's equipment. However, as connect-time based pricing has been the norm since the beginning of online searching, many techniques and much technology have evolved to minimize the time a searcher is connected to a database to conduct a search. In response, most online database operators increased connect-hour charges to compensate for the decreasing time their databases were used. The resulting astronomical connect-hour charges place the highest charges on a parameter that has no relationship at all to the value of the online search and discourage users from making full use of the interactive capabilities of online searching by pressuring them to minimize the time they are connected to a database. With the reduced connect-hour charges, users can browse the files, test the queries, review potential answers, and reformulate their search strategies at a thoughtful pace. That would help them realize much greater value for the money they spend on online searching.

Subbiah Arunachalam

SCIENTIFIC CORRESPONDENCE

Anopheles minimus in Assam

Anopheles minimus Theobald was considered to be the chief vector of malaria in the foothills of Himalayas extending from Uttar Pradesh to Assam because of its predominantly domestic habits and preference for human blood[1,2]. However, subsequent studies, after application of DDT as residual insecticide, showed the absence of this species from the Terai region of Uttar Pradesh[3] and Burnihat area of Meghalaya[4] adjacent to Sonapur in Kamrup district, Assam. The possible involvement of other species, e.g. *A. philippinensis* and *A. balabacensis*, in transmission of malaria in Meghalaya and Arunachal Pradesh has been suggested[4,5]. Rao[6] believed that the species though reduced in number was still present and could have been playing a role in malaria transmission. Since no definite information

was available regarding the status of vector in Sonapur which is one of the most affected PHCs of Kamrup district, the present study was undertaken.

For vector incrimination, suspected vectors namely *A. minimus*, *A. balabacensis* (*A. dirus*) and *A. philippinensis* (*A. nivipes*) along with other anophelines, were caught off human bait in the night and collected from human dwellings in different villages with the help of suction tube in the morning and day. Mosquitoes were anaesthetized with ether and identification was made on the basis of their anatomical features, namely presence or absence of bands and specklings on legs, banding pattern of palpi, length and tip of proboscis, presence or absence and the number of bands or patches on costa and subcosta of the wings and scaly interruptions on wing veins, with the help of standard keys[7–9]. Identified specimens were dissected to look for sporozoites in the salivary glands. Sporozoite-positive slides were stained with Leishman's stain[10]. For determination of the Human biting index (HBI) blood smears were prepared on Whatman filter paper No. 1 and analysed by agar gel diffusion technique[11].

The results are summarized in Tables 1 and 2. Different anophelines collected from human dwellings during the daytime showed dominance of *A. minimus* as earlier observed by Das and Baruah in Mizoram[12]. *A. minimus* was the only species which showed positive salivary glands (Figure 1) and high HBI. *A. balabacensis* (*A. dirus*) showed predilection for human blood but none of them was found positive, which may be attributed to their lesser number. Other species such as *A. philippinensis* (*A. nivipes*), *A. annularis*, *A. vagus* and a few others were also examined but they were negative for sporozoites. Blood meal analysis showed HBI 0.90 for *A. minimus*. May and June are supposed to be the active transmission period in Sonapur.

These findings give evidence that *A. minimus* is endophagic and endophilic in nature and has preference for human blood and is responsible for malaria transmission.

A. minimus positive for human blood was 90% while the maximum sporozoite positivity rate was only 3.349%. As far as high HBI is concerned it is simply because of strong preference of *A. minimus* for human blood. Low sporozoite positivity rate is because mosquitoes were collected from different houses of several villages and only a fraction of the captured *A. minimus* were infected. Out of infected mosquitoes a few of them completed sporogeny at the time of dissection. Since sporozoites reach salivary glands only after 10–12 days, probability of sporozoite positivity rate at the time of dissection becomes very low in comparison to high HBI. The 3.349% sporozoite positivity rate is however not a low count as far as malaria transmission is concerned and will be responsible for higher rate of malaria incidence and slide positivity rate. Since *A. minimus*, which exclusively breeds along streams, is the principal vector in the area under study, and control measures may be directed against this species on priority basis in future in order to control malaria.

Our finding of incriminating *A. minimus* as probable vector in Sonapur is fully in agreement with Bhatnagar *et al.*[13], Das and Baruah[12], and Dutta and Baruah[14] who incriminated *A. minimus* in Nagaland, Mizoram and Arunachal Pradesh and

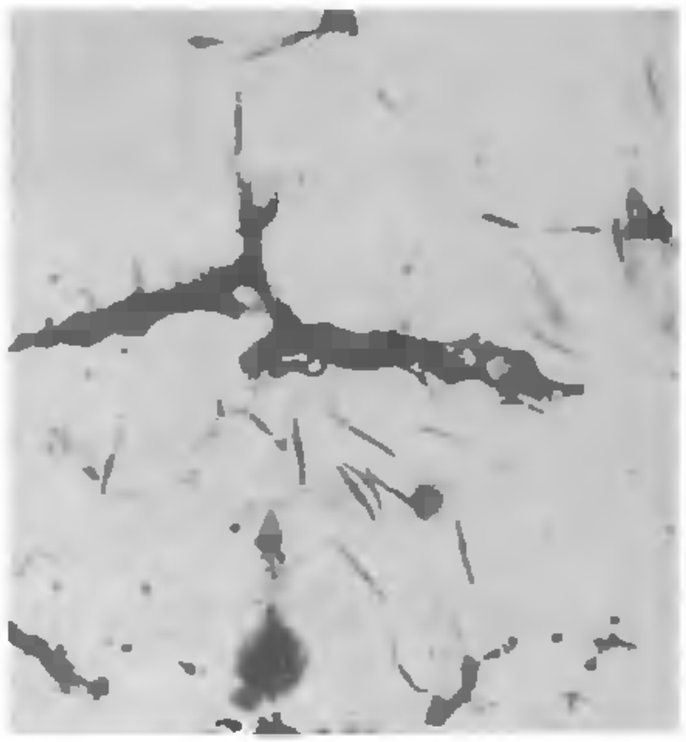

Figure 1. Sporozoites in dissected salivary gland of *A. minimus*.

the sporozoite positivity rates observed by these workers ranged from 1.4% to 8.3%. In the present study the gland sporozoite positivity rate during June was 3.349%, which is in conformity with that of Das and Baruah in Mizoram (3.4%).

It is surmised that *A. minimus* never disappeared from the northeastern region but may have reduced in number, reestablished itself in the area with poor spray coverage, and it was and still is acting as a principal vector, as earlier suggested by Rao[6]. But the possibility of partial transmission by other anophelines in this area cannot be ruled out completely as *A. philippinensis* was incriminated by Rajagopal[4] in Burnihat which is very near our experimental area. It is quite possible that due to excessive use of different insecticides in human dwellings in preceding years mosquitoes were forced to go out and rest outside. Since there are plenty of ideal places for resting in jungle near breeding sites, mosquitoes probably preferred to stay there and visited human dwellings for only a brief period for their blood meals. But it has been observed that the suspension of spray operation in our study area in recent years has caused an increasing trend of gaining entry and resting by *A. minimus*.

Table 1. Blood meal analysis result for *A. minimus*

Number of blood smears analysed	Number positive for human blood	Number positive for bovine blood	Mixed
755	684 90.6%	10 1.32%	5 0.66%

Table 2. Result of dissection of *A. minimus* collected from human dwellings

Month	Number collected	Abdominal condition* UF	FF	SG	G	Dissection Gland	Gut	Positive Gland	Gut	Sporozoite positivity rate
May 1989	647	29	344	93	181	607	70	14	—	2.306
June 1989	876	34	439	118	285	836	90	28	—	3.349
May and June	1523	63	783	211	466	1443	160	42	—	2.91

*UF, Unfed, FF, fully fed, SG, semigravid; G, gravid.

1. Ramsay, G. C., Chandra, S. N. and Lamprell, B. A., *Rec. Mal. Surv. Ind.*, 1936, **6**, 49.
2. Viswanathan, D. K., Das, S. and Oomen, A. V., *J. Mal. Inst. Ind.*, 1941, **4**, 293.
3. Chakraborty, A. K. and Singh, N. N., *Bull. Nat. Soc. Ind. Mal. Mosq. Dis.*, 1957, **5**, 82.
4. Rajagopal, R., *J. Comm. Dis.*, 1976, **8**, 235.
5. Sen, A. K., John, V. M., Krishnan, K. S. and Rajagopal, R., *J. Comm. Dis.*, 1973, **5**, 98.
6. Rao, T. R., *The Anophelines of India*, rev. edn Malaria Research Centre, ICMR, New Delhi, 1984.
7. Christophers, S. R., *The Fauna of British India Including Ceylon and Burma*, Taylor and Francis, London, 1933, vol. IV, p. 1.
8. Barraud, P. J., *The Fauna of British India Including Ceylon and Burma*, Taylor and Francis, London, 1934, vol V, p. 1.
9. Knight, K. L. and Stone, A., *A Catalog of Mosquitoes of the World (Diptera: Culicidae)*, Entomological Society of America, Maryland, 1977, p. 1.
10. Choudhury, D. S. and Ghosh, S. K., *Indian J. Malariol.*, 1982, **19**, 143.
11. Ouchterlony, O., *Ark. Kemi.*, 1949, **B26**, 1.
12. Das, S. C. and Baruah, I., *Indian J. Malariol.*, 1985, **22**, 53.
13. Bhatnagar, V. N., Dwivedi, S. R., Misra, B. G. and Das, M., *Indian J. Malariol.*, 1982, **19**, 129.
14. Dutta, P. and Baruah, B. D., *Indian J. Malariol.*, 1987, **24**, 159.

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COMMENTARY

Nuclear power and safety

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Safety has many aspects to it. Let us start with the standard question, 'How safe is safe enough?' We have to arrive at a satisfactory answer to this question in our own socioeconomic context. There are certain minimum developmental needs of our society. As scientists and technologists we have to find ways of fulfilling these needs in an acceptable manner after considering carefully the options available to us. This acceptance should be based on a scientific evaluation of the comparative environmental impact of the various options based on our own conditions rather than on ideas transplanted from a society whose developmental needs are already largely fulfilled.

Emerging international regime

Safety and environmental issues are fast achieving global dimensions. While this in itself is a good thing, it is also leading to a kind of restrictive international regime which tends to disfavour some of the older technologies which are available to developing countries, and the technology differentials this may create between the developed and the developing countries are likely to have an adverse impact on the economies of the latter. One can see signs of such restrictive technology environment in terms of CFC issues, carbon dioxide and other greenhouse gases-related issues and also in terms of nuclear power technology. For a country like India where the market is very large, it is clear that we must have our own technology which is as much on par as possible with the best technology available outside. At the same time we must try to protect ourselves from the adverse economic impact arising out of the possible restrictive regime created through globalization of safety and environmental concerns.

In this context there is also a need to address issues arising out of the emerging international regulatory regime for nuclear power. From an overall view such a development does appear logical and even necessary. There could however be several implications with regard to its practical application. There are difficulties in adopting a common regulatory approach even in the case of the pressurised water reactors (PWRs) because their evolution has gone on along somewhat different paths in different countries. Then there are questions related to adoption of a common framework for different reactor types being built in different countries. There are also questions relating to the fact that any regulation is normally a matter in the purview of the national body like the Atomic Energy Regulatory Board (AERB) in our case. While there is a lot to learn from one another's experience in the matter of technical aspects of safety, in achieving minimum standards in design and operation of nuclear power plants, etc., we have to necessarily keep enforcement aspects within the frame of the national regulatory agency. We have been, of course, strongly advocating the need to enhance international exchange on various technical aspects of safety including sharing of results of safety research.

Safety of our PHWRs

We have adopted the pressurised heavy water reactor (PHWR) system on account of its favourable characteristics which are better suited to Indian conditions and objectives. Since the number of

Based on the inaugural address at the symposium on 'Safety of nuclear power plants and other facilities' at BARC, Trombay, on 11 March 1992