

# Nomenclature, classification and the basis of the Schedules in the Indian Wildlife (Protection) Act, 1972

Prashanth Mohanraj and K. Veenakumari

*'Without taxonomy to give shape to the bricks, and systematics to tell us how to put them together, the house of biological science is a meaningless jumble'.*

—R. M. May<sup>1</sup>

Two strategies are fundamental to the conservation of biodiversity. They are (i) the protection of endangered species to enable them to stage a recovery in population sizes, and (ii) the protection of habitats with minimum possible interference by man so that organisms (including the large number of unknown and undocumented species) can live in conditions as close to their natural state as possible. It is precisely with these objectives that the Wildlife (Protection) Act was enacted by the Government of India on 9 September 1972 (ref. 2). The Act was from time to time amended to plug loopholes to enhance its effectiveness in meeting these objectives. The most significant of these amendments came into force on 2 October 1991 (ref. 3) when in addition to other changes, 'Chapter III A' was included to protect species of plants. With these two years serving as points of reference we propose to examine:

- (i) changes in the representation of the biotic entities in the Schedules;
- (ii) the extent to which the listings in the Schedules conform to the rules laid down in the International Code of Zoological Nomenclature (ICZN),
- (iii) the internal consistency of the Schedules, and
- (iv) the rationale for listing and transferring taxa in the Schedules.

## The Schedules: An overview

The number of Schedules in the Wildlife (Protection) Act increased from five in 1972 when the Act first came into force to six in 1991 when for the first time plants were included (in the newly created sixth Schedule), thus changing forever the zoocentric nature of the Act. The total number of plants and animals listed in the Schedules increased from 184 to 822. This, more than four-fold increase in 19 years indicates that on an average 34 animals or plants were being added

annually. While Schedules I, II, III, IV and VI provide varying degrees of protection to the organisms listed in them, Schedule V is unique in having species (all listed by their common names only) labelled 'vermin' which are not afforded protection of any kind. Schedule I and Schedule II (Part II) species are covered by the most stringent regulations in the Act while species in Schedules II (Part I), III and IV are afforded progressively lower levels of protection.

In 1972 it was only vertebrates represented by mammals, reptiles and birds, that found a place in the Schedules in the Act. In the succeeding years, amphibians (among vertebrates), crustaceans, insects (among the invertebrates) and finally plants were included in the Act. The proportion of mammals diminished from about 60% in the 1972 Act to 17% in 1991 while invertebrates represented by butterflies, beetles, a dragonfly and the robber crab now constitute nearly 60% of all entries in the Schedules. Plants surprisingly constitute less than 1% of the entries. Even within the vertebrates, the proportion of mammals diminished to 43% with additions to the list of birds, reptiles and a few (3 spp.) amphibians. Among the invertebrates, butterflies by far outnumber (92%) the others.

The change in proportions is the result of an increase in the total number of entries in the 1991 Act as compared to the 1972 Act (Table 1). In particular, the proportion of species in Schedules I and II (Part II) has more than doubled from about 39 to 80%, implying that the vast majority of the organisms specified in the Act are now under stringent legislative protection. This tremendous increase in number of entries in these Schedules is because 57 of the 58 transfers effected since 1972 have been made to Schedule I (36 entries) and II (Part II) (21 entries) (Table 2). In addition, 531 of the 638 new plants and animals that find a place in the Schedules have been added to Schedules I and II (Part II), which constitutes 83% of all additions.

The increase in the level of protection given to species already listed in the Schedules and maximum protection being given to the majority of the species being added anew to the Schedules goes to show:

- (i) that 19 years of legislative protection has not helped species listed in the Act to recover to population levels high enough to obviate the necessity for protection, and

Prashanth Mohanraj and K. Veenakumari are in the Central Agricultural Research Institute, P.B. No. 181, Port Blair, Andamans 744 101, India.



**Table 1.** Comparison of the number and proportion of plants and animals in the Schedules in the 1972 and 1991 editions of the Indian Wildlife (Protection) Act

		1972		1991	
		<i>n</i>	%	<i>n</i>	%
<b>Vertebrates</b>					
Mammals	I(I); II(I); II(II); III; IV; V	177(+ 7) 111(+ 6)	96.20(+ 3.80) 60.33(+ 3.26)	322(+ 4) 137(+ 3)	39.17(+ 0.49) 16.67(+ 0.36)
Birds	I(III); IV; V	60(+ 1)	32.61(+ 0.005)	133(+ 1)	16.18(0.12)
Reptiles	I(II); II(I); II(II); IV	6	3.26	49	5.96
Amphibians	II(I); IV	—	—	3	0.36
<b>Invertebrates</b>					
Crustaceans	I(IV)	—	—	490	59.16
Insects		—	—	1	0.12
Butterflies	I(IV); II(II); IV	—	—	489	59.49
Beetles	II(II)	—	—	451	54.87
Dragonfly	I(IV)	—	—	37	4.50
		—	—	1	0.12
<b>Plants</b>					
Gymnosperms	VI	—	—	6	0.73
Angiosperms	VI	—	—	1	0.12
		—	—	5	0.60
<b>Total</b>		<b>184</b>		<b>822</b>	

Note: Figures in parentheses denote organisms included as vermin in Schedule V.

**Table 2.** Changes in the number of entries in the Schedules of the Indian Wildlife (Protection) Act between 1972 and 1991 by way of transfers and additions

Schedule	Part	Transfers between Schedules (1972-1991)		Additions (up to 1991)	Post 1972 inclusions (transfers + additions)
		From	To		
I	I	—	31	5	36
	II	—	1	18	19
	III	—	4	22	26
	IV	—	—	130	130
II	I	23	—	8	8
	II	3	21	356	377
III		11	—	—	—
IV		18	1	93	94
V		3	—	—	—
VI		—	—	6	6
<b>Total</b>		<b>58</b>	<b>58</b>	<b>638</b>	<b>696</b>

(ii) that many species previously not in need of protection, now require protection by inclusion in the Act [and that too in Schedules I and II (Part II)].

No animals have been deleted from the 1972 Act. All of them remain in the 1991 Act. However a comparison of the 1991 amendment with the 1986 amendment<sup>4</sup> shows the deletion of one beetle and 3 butterflies from Schedule II (Part II) and one species of fox from Schedule IV. These we feel, are in all probability inadvertent deletions rather than an indication of their having staged a recovery in population sizes eliminating the need for legislative protection. Such errors should be avoided at all cost in a document of this nature.

### Nomenclatural inconsistencies and other anomalies

Along with the inclusion of increasing numbers of plants and animals in the Schedules of the Act, there appears to be a progressive deterioration in the listing of species group names. Scientific names according to convention are to be italicized while names of higher taxa are not. In the 1972 Act, even families are italicized, while in the 1991 Act no scientific names – which number about 700 – are italicized. Many common names and scientific names in most Schedules are incorrectly spelt. The robber crab becomes a rubber (!) crab and *Euchrysops cnejus* is spelt as 'Enchrysops onejus' while *Atella alcippe* becomes the unpronounceable 'Atella lscippe'. These are all Schedule I and Schedule II (Part II) species and they are only a smattering of such errors that one could point out from almost any Schedule in the Act. The spellings of scientific names are not to be taken lightly, for as detailed in the International Code of Zoological Nomenclature<sup>5</sup>, the difference of even a single letter in a genus or species group name signifies a different genus or species. Accordingly 'Enchrysops onejus' is not the same as *Euchrysops cnejus*, the lycaenid butterfly that was first described by Fabricius and which is the species that exists objectively in nature. No species by the former name has ever been described and so the name signifies no objectively existing species. Hence strictly speaking, no one can be prosecuted under any of the sections of our Wildlife (Protection) Act for hunting or trading *Euchrysops cnejus* for it does not exist in the Act. And



no one would ever commit a culpable offense by capturing 'Enchrysops onejus' for no such species of butterfly exists anywhere in our (or for that matter any) country!

Ensuring that 'each [scientific] name is unique and distinct' is among the explicitly-stated objectives of the ICZN. To do this, the code lays down a number of rules which validate only a single name for a species. All other names are to be rejected as invalid. One can find quite some invalid scientific names in the Schedules of our Wildlife (Protection) Act. All the species listed under the genus *Polydorus* (Papilionidae) in Schedules I and II (Part II) for instance, are invalid names. They belong to the genera *Pachliopta* and *Parides*.

## Internal consistency

The system of binominal nomenclature based on Linnaeus, which we follow even today, is based on a system of 'ranking in a hierarchy of categories'. While the 'Kingdom' is the highest category, the 'Species' forms the lowest rank in the hierarchy. Each lower taxon is included within all the taxa above it. This being the case, why should Cetatean (*sic*) sp. (other than those listed in Schedule I and Schedule II (Part II)) and the sperm whale [*Physter (sic) macrocephalus*] be listed in Schedule II Parts I and II respectively, when all species belonging to the order Cetacea (entry 4A) are protected in Schedule I (Part I)? It also makes little sense to include Megapodidae in Schedule IV when the only species of the family that occurs in India, the Nicobar megapode (*Megapodius freycinet*) is already listed in Schedule I (Part III).

A host of other inconsistencies can be detected in the Schedules of the W(P)A. The system of numbering the entries is very confusing. Why should all the butterflies and beetles be given against one number while each vertebrate species is listed against a number? There is inconsistency in the mention of common names for butterflies. Though butterflies figure prominently in terms of numbers in Schedule I, II and IV the common names of only the species listed in Schedule I are given. Most, even if not all, of the butterflies listed in Schedules II and IV have common names too. Then why aren't they given? 'Butterflies and moths' say the titles in Schedules I and IV. Since the Act was passed in 1972 no moth has ever been listed! And, strangely in Schedule II (Part II) all the butterflies are listed under the entry 'Beetles' both in 1986 (ref. 4) and in 1991. *Hypolimnna missippus (sic)* has been listed in both Schedule I (Part IV) and Schedule II (Part II), while the same two species of pole cats are listed in Schedule II (Part II) and Schedule IV—for what earthly reason? An even more startling repetition is that of Sclaters' monal *Lophophorus sclateri* which is included along with *L. impejanus* as entry 7-c

in Part III of Schedule I and nine entries later reappears as entry No. 13 in the very same Schedule.

## Rationale

While most of the above are grave lapses in a document that has to pinpoint the species involved, to guide action on a very serious matter, a graver lapse occurs in the formulation of the Schedules. And that is the basis on which status assessments have been made for the species of invertebrates in particular. The listing of the majority of the invertebrate species has not (we feel) been done on the basis of objective field assessments. Scarcity in museum collections and information in early published works seem to have been the determining criteria for placing species in the Schedules. That these are not reliable criteria is amply evident from our observations of the butterflies of the Andaman and Nicobar islands. While most earlier reports indicate that *Pachliopta coon sambilanga* is very rare in Great Nicobar, we found them to be 'plentiful'<sup>6</sup> as described by Doherty over a 100 years earlier when he first described them. Yet, since this species is poorly represented in museums and because no other collector, not even the nine collection parties of the ZSI between 1964 and 1976 found it, it has been entered in Part IV of Schedule I of the W(P)A. We have found *Polyura schreiber tisamenus (Eriboea schreiberi)* in the Act) to be 'not rare' in the mangals of these islands. Yet it is a Schedule I species. *Castalius rosimon alarbus* (Schedule I) is another species that we have found to be quite plentiful. Why are they listed in the Schedule at all? Laxity in the listing of species in the Schedules, we feel, do them more harm than good. The very purpose of listing them in the Schedules is to enable them to recover from low population levels so that they will not be in danger of extinction. To achieve this, however, we need much more information about these species than we currently have. By listing them in the Schedules and protecting them totally we hamper the gathering of such information.

The mere listing of a species in a Schedule is not enough to enable it to stage a recovery from declining numbers. For many, if not most, species listed in the Schedules we know very little or next to nothing about their ecological requirements. Without detailed knowledge of these requirements, it would not be possible to formulate effective protective measures for each of the species as part of a well-chalked out recovery plan to save the species from ultimate extinction.

If stringent laws are clamped down on species on which little is known, then no manipulative studies can be carried out on them and vital information which would be absolutely essential for the formulation of a programme of action for preserving the species would never be forthcoming. We may even be destroying some



vital resource of the species in our ignorance while it continues to remain enlisted in the Act. As is well known, there are many species which spend different parts of their lives in different habitats serving as 'mobile link species'<sup>7</sup>. A National Park or Sanctuary may only be one of these habitats, destruction of one or other vital habitat of such species would effectively wipe out the very species we intend saving. Scientific institutions and individuals should be encouraged to carry out studies on species listed in the Schedules. Only on the basis of such studies can action plans be drawn up for the preservation of each of these species.

The listing of species in the W(P)A should not only focus attention on its precarious status but should also engender studies that will detail the precise ecological requirements of these species. A plan to preserve or

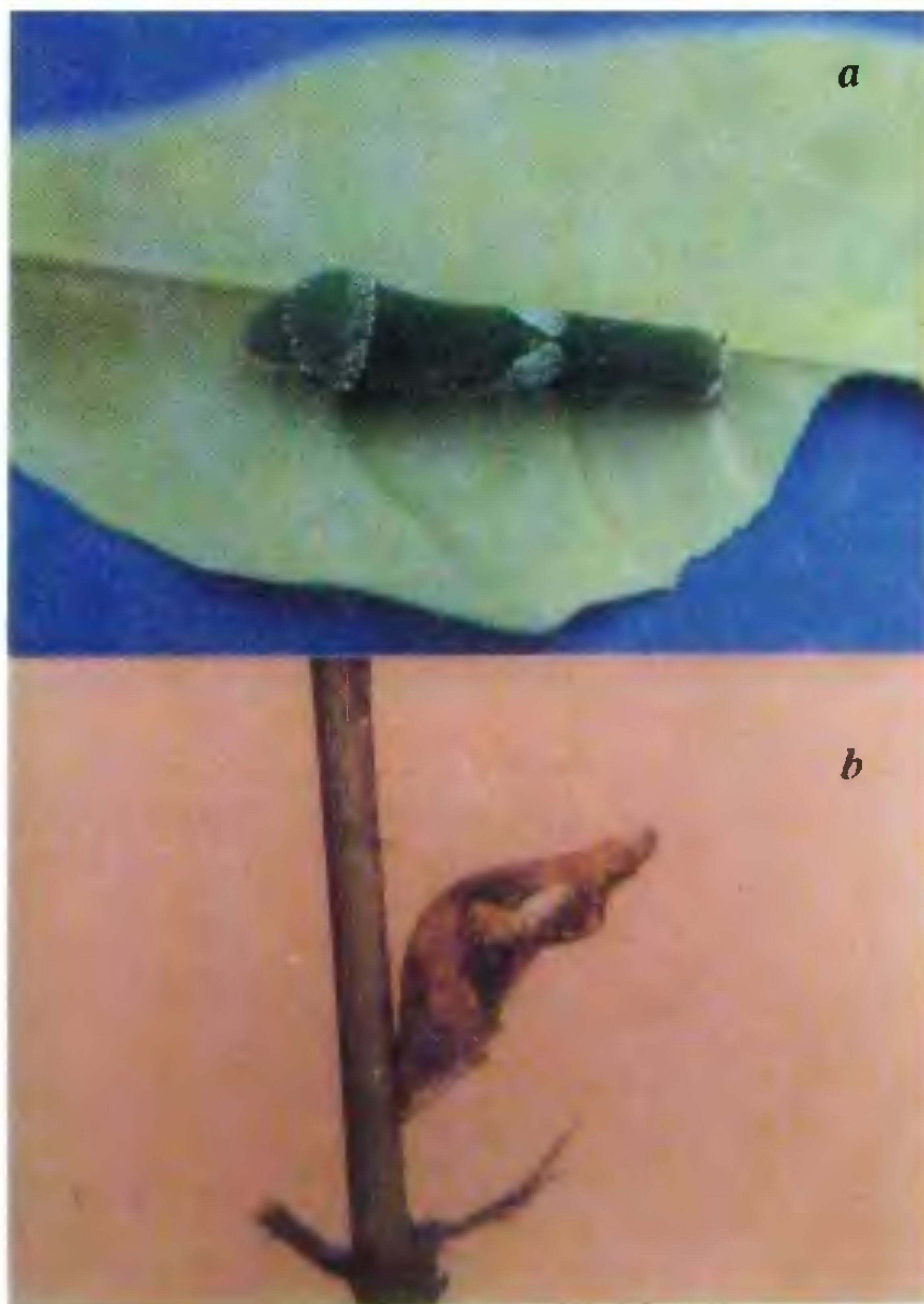
restore the essential links in the species' requirements has then to be formulated if it is to be saved. Premature listing of species under stringent legislative controls could be as counterproductive as the late listing of species could be unproductive.

While we should definitely correct the errors that occur in the Schedules we should also take a second look at the species already listed in them to determine whether they should continue to remain there? Perhaps the lists ought to be revised.

Finally, serious thought has to be given to the necessity for specifying the areas where a species is to be protected as is the case in the US Endangered Species Act<sup>8</sup>. The current practice of all Scheduled species enjoying Pan-Indian protection should be discontinued. Protection for each species should be on an area-specific basis. To illustrate the necessity for circumscribing the geographic limits for the protection of each species consider the case of the spotted deer or chital (*Axis axis*). It is a Schedule I species. Native to the Indian mainland they were introduced to the Andaman islands by the British



**a, b.** *a*, The male and *b*, female of the Andaman mormon, *Papilio mayo* Atkinson which is listed in Schedule II (Part II) of the Wildlife (Protection) Act. It is one of the three 'poorly known' endemic swallowtail butterflies from the Andaman Islands according to the IUCN/SSC Lepidoptera Specialist Group<sup>13</sup>. Recent studies indicate that this butterfly is not facing the threat of extinction<sup>14</sup>. Should it continue to be listed in the Wildlife (Protection) Act? [Photo: B. Pardhasaradhi].



**a, b.** *a*, The larva and *b*, pupa of *P. mayo* which were discovered only recently<sup>14</sup> [Photo: B. Pardhasaradhi].



in 1920 (ref. 9). In the total absence of predators they proliferated on these islands. They also spread to many of the neighbouring islands which were separated by relatively narrow stretches of sea. A futile attempt was made in 1952 to check the increase in numbers of this alien herbivore by introducing two female leopards<sup>10</sup>. Though the chital are pests in the farms and forests of these islands the W(P)A stipulates that it is against the law to kill them. Wouldn't it be prudent to make the law inapplicable to the deer on these islands? To take another example *Castalius rosimon alarbus* is 'common' in the Andamans but 'very rare' in the Nicobars<sup>11</sup>. Should the two populations enjoy the same amount of protection? We feel that the Nicobar population could be protected if it is declining in numbers while the Andaman population need not be afforded any protection. The distinction between locally and nationally-endangered species has to be made<sup>12</sup>.

This brings us to another important question, should 'rarity' alone be a criterion to include species in the Schedules for protection? It is a well-known ecological fact that while some species are abundant, others are rare in a community. Only those species which are shown to be decreasing in numbers should, we think, be included in the Schedules of the Act. In short we have to once again take a closer look at the species included in the Schedules of the W(P)A to determine *which species* are to be protected *where*? This calls for the generation of a much greater quantum of information on each species before it is included for protection in the W(P)A.

1. May, R. M., *Nature*, 1990, 347, 129-130.
2. Anonymous, The Wildlife (Protection) Act 1972, *Andaman and Nicobar Gazette* Extraordinary No. 134, 27 November 1972, Part 2, pp. 17-40.
3. Anonymous, The Wildlife (Protection) Act, 1972 as amended up to 1991, Ministry of Law and Justice, GOI.
4. Anonymous, The Wildlife (Protection) Act, 1972 as amended up to 1 July 1986, Ministry of Law and Justice GOI.
5. Mayr, E., *Principles of Systematic Zoology*, Tata McGraw-Hill, New Delhi, 1977, pp. 297-333.
6. Veenakumari, K. and Mohanraj, P., *Malayan Nat. J.*, 1994, 48, 89-91.
7. Gilbert, L. E., in *Conservation Biology: An Evolutionary Ecological Perspective* (eds Soule, M. E. and Wilcox, B. A.), Sinauer Associates Inc., Massachusetts, 1980, pp. 11-35.
8. Wilcove, D. S., Mcmillan, M. and Winston, K. C., *Conser. Biol.*, 1992, 7, 87-93.
9. Whitaker, R., *Endangered Andamans: Managing Tropical Moist Forests*, ESG, WWF and MAB, India, 1985.
10. Gee, E. P., *The Wildlife of India*, Fontana Books, London, 1969.
11. Evans, W. H., *Identification of Indian Butterflies*, Diocesan Press, Madras, 1932, 2nd edn.
12. Kothari, A., Pande, P., Singh, S. and Variava, D., *Management of National Parks and Sanctuaries in India: A Status Report*, Indian Institute of Public Administration, New Delhi.
13. New, T. R. and Collins, N. M., *Swallowtail Butterflies: An Action Plan for their Conservation*, IUCN, Switzerland, 1991.
14. Prashanth Mohanraj and Veenakumari, K., *The Entomologist*, 1995, 114, 166-178.

ACKNOWLEDGEMENTS. We are grateful to Dr A. K. Bandyopadhyay, Director for constant encouragement. We thank Tarun Coomar and Samir Acharya for having made the various Schedules of the Wildlife (Protection) Act accessible to us and to T. V. R. S. Sharma for computer facilities. We also thank K. Chandrashekar, T. R. New, J. D. Holloway, Shekhar Singh, A. J. T. John Singh and J. C. Daniel for their comments on the paper.