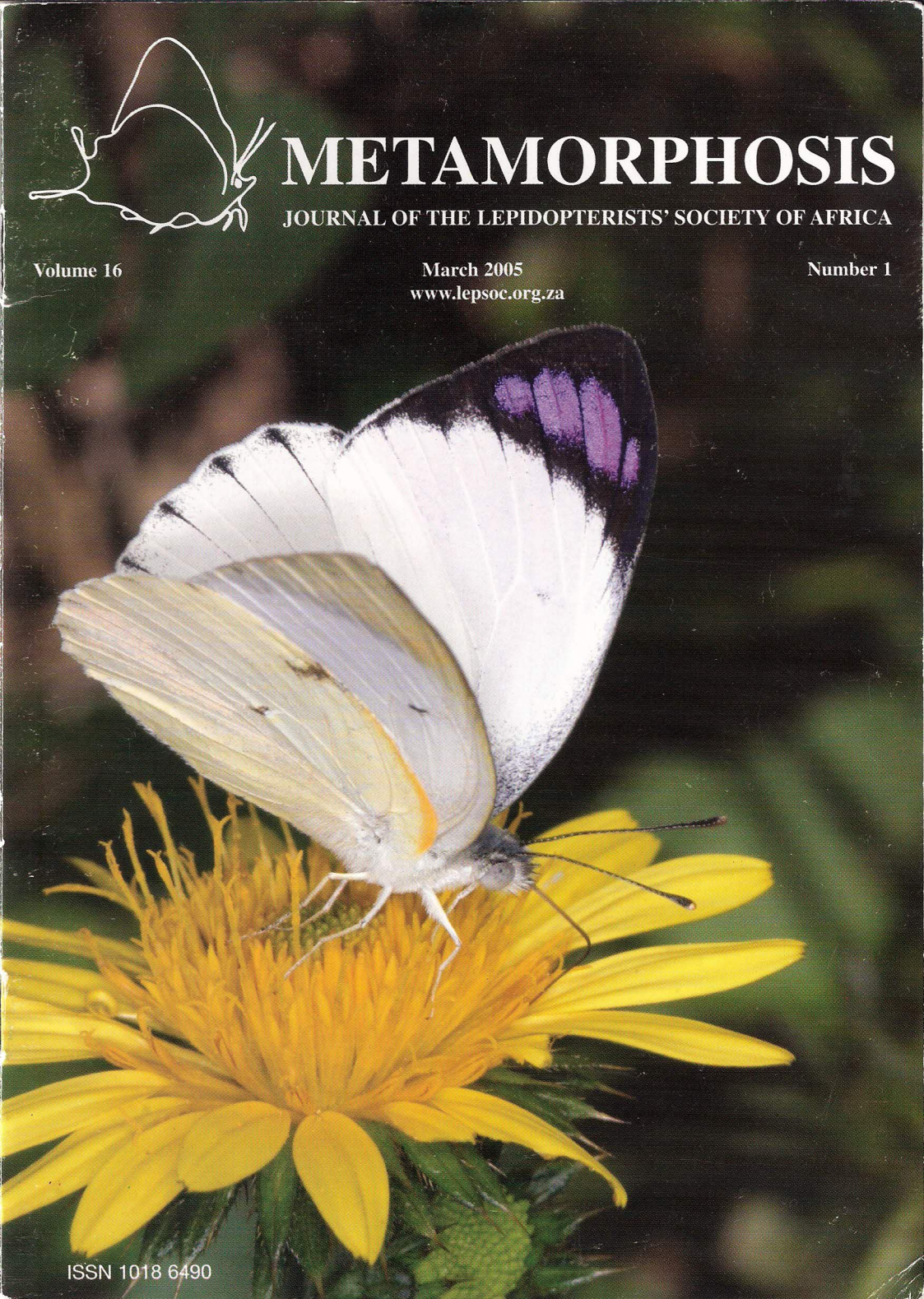

# METAMORPHOSIS

JOURNAL OF THE LEPIDOPTERISTS' SOCIETY OF AFRICA

Volume 16 March 2005 Number 1
www.lepsoc.org.za

ISSN 1018 6490

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The aims of the Lepidopterists' Society of Africa are to promote the scientific study and the conservation of Lepidoptera in Africa, and to provide a communication forum for all people who are interested in African Lepidoptera.

*Metamorphosis,* which is the official journal of the Society, publishes original scientific papers as well as articles of a less technical nature. Fees indicated below refer to surface postage, but if airmail is required, notify the Treasurer and - per issue – add R32.00 for Africa or US $6.00 if Overseas.

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# METAMORPHOSIS

ISSN 1018-6490

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Front cover: Coast Purple Tip, Embotyi forest, Eastern Cape Province, South Africa, 22-03-2005, Andre Coetzer.
Back cover: Brown Commodore, Embotyi forest, Eastern Cape Province, South Africa, 22-03-2005, Andre Coetzer.

# Editorial

Over the years there has been a debate about the possibility of having two societal publications, instead of the single *Metamorphosis*. Proponents of the 'two publications' viewpoint suggest that there should be one publication containing scientific papers and another containing news, anecdotal and other 'non-scientific' contributions. The other school prefers to remain with the *status quo*.

This issue was briefly debated at the AGM in Potchefstroom in November 2004 and members present at the meeting were asked to e-mail their ideas about this issue to the Editor of *Metamorphosis*. Since many of our members were not present at the Potchefstroom conference the Council has asked me to write this short editorial inviting you to comment.

Please take this opportunity to let me know what you think. Remember, this is your Society and your Council wants to make a decision on this issue that reflects the will of its members.

Sincerely,

Mark Williams
E-mail: mark.williams@up.ac.za

# Gauteng in Spring is a glorious place

Steve Woodhall
2 Madeleine Drive, Gillitts, KwaZulu-Natal

Yes, as you can see, I've joined the ranks of Banana Boys! But before we moved, I was able to get in one last spring in Gauteng, one of the highlights of Africa. During the cold dry days of winter, veld fires burn and nothing green seems to survive. Then there is a bit of rain, the days get longer and all of a sudden the blackened earth shows a flush of green. Flowering herbs make myriad clumps of colour. In the Magaliesberg, the trees put forth their fresh, sweet new growth. Flowers burst out, and Lepidoptera begin to stir.

What's special about Gauteng's spring are the Lycaenidae. Many of the adults only fly at this time of year, their progeny taking a full year to develop and grace another spring. It's a fine feeling to see a freshly-emerged butterfly in the still-dry, waking bush.

On September 24th, 2004 I went with Jeremy and Chris Dobson to the Johan Rissik Reserve near Hartbeespoort Dam, because it's a good place to look for the Saffron Sapphire, *Iolaus pallene*. We walked through the dry bush, looking carefully for small golden yellow butterflies. I'd bred this some time ago and photographed the adults, but I wasn't happy with the results. Besides, photographing newly-emerged butterflies is a bit like shooting tame ducks; the challenge of a wild shot called!

The usual early bushveld butterflies were out, such as Guinea Fowl *Hamanumida daedalus*, Bowker's Sapphire *Iolaus bowkeri tearei*, and Pirate *Catacroptera cloanthe*. Walking along a dry streambed, the leaves of the River Bushwillow *Combretum erythrophyllum* were a startling gold and bronze. This tree loses its leaves in spring before the flowers and fresh leaves bud. The beautiful "Lekkerbreek" *Ochna pulchra* was in full new leaf and flower; and Chris saw our quarry near one of these. He called out… Jeremy and I ran towards him, ready for action.

We saw a male, flying around the bushes in the streambed. Jeremy and I started stalking him, cameras in hand – Jeremy digital, me still with film. Not for the first time it struck me that catching butterflies with a net is one thing, using a camera is another. It's also much more of a challenge to get a real wild shot of a butterfly behaving naturally, in a way that says something about that behaviour, than it is to shoot a bred one in a studio.

Our little male unerringly made for the River Bushwillows; their leaves were the very colour of his wings. Again and again we tried to creep up on him but he flew off, circling about and ALWAYS settling on those golden yellow leaves. Eventually he grew trusting, and allowed me to

approach him closely. I took my usual "insurance" shot as soon as I could get him in focus with a 105 mm macro lens and 3 dioptre close-up filter, then the "Hiroshima effect" from my ring flash kicked in and I got several shots at different f-stops, very close indeed! Jeremy also got some good shots and we followed him around in the hope he'd open his wings for a shot – but no dice, you can't have everything…

So… why is *pallene* the only yellow *Iolaus*? Now I believe we know. It flies when the leaves are yellow and hides in them to great effect. Both sexes use yellow flowers for nectar. It doesn't use shiny leaves for camouflage as do all the other blue and pearly sapphires.

After an abortive trip to Horns Nek to look for Hutchinson's Highflyer *Aphnaeus hutchinsonii*, we found ourselves at Enoch's Walk. This has to be one of the most unpleasant places to walk. Only the lava fields of Kenya are worse. Those razor-sharp pieces of ancient seashore (Pelindaba Rock) always seem to tip over just as one puts one's weight on them. It was dry, but the Wild Pear *Dombeya rotundifolia* were in full flower. The Red-leafed Rock Fig *Ficus ingens* and Sour Plum *Ximenia caffra* were in fresh leaf. There was a chance of seeing good lycaenids.

I was after something that has eluded me for a long time… an upperside shot of a perfect male Silvery Bar *Cigaritis phanes*. I'd been there before and photographed scruffy ones, and had a semi-scruffy one from Witsand for the book.

We trudged up the hill and over the top to the place where the male *phanes* always dogfight. A strong north-easterly wind was blowing, and two males were sporting around in it. Every time they settled on an Aloe seed-head (their favourite perching place here) they sat with wings closed. "That's no good I thought; I got a good underside shot at Witsand" – but I took one anyway. And that wind kept on blowing. I waited patiently, watching them all the time. They grew used to my presence, settling ever closer to me. They always rested on the leeward side of the perch, wings closed as the wind buffeted them.

Eventually as the afternoon wore on the sun started to go down the sky. Jeremy and Chris were watching them too, but I was concerned that I was being selfish so asked if they'd like to go. They said no, so on we waited. It's a good job we did because suddenly the wind dropped.

Almost immediately the male I was watching turned towards the sun, and opened his wings to 45º. What a beautiful specimen! Dewy fresh, his orange forewing tips and gas-flame blue iridescence were a stunning combination. He had a slight hindwing chip where a bird had had a go at one of his tails, but that made for a more valuable wild shot…

Both males were by now perching with wings open and Jeremy and I both got plenty of shots. Interesting how they only did this once the wind had died down. Was it because the shyer females would only fly in calmer

conditions, making it only then worth the males' while risking a bird seeing their bright upperside colours?

We'd all learned something about butterfly behaviour during this short safari, and the value of patient observation.

Chris got a couple of specimens too…

# A closer look at Darwinism

Ernest Pringle
Huntly Glen, Bedford.

Recently I asked one of South Africa's top physicists whether there had been any major breakthroughs in physics during recent years; his reply was – not since Einstein's Theory of Relativity. It is the same in Zoology – no major breakthroughs since Charles Darwin.

Darwin's Theory of Evolution forms the basis of modern zoological thinking; subsequent thinkers have attempted to modify the theory into Neo-Darwinism and Post-Darwinism but, recently, scientists appear to have reverted to the original. Darwin was originally trained as a theologian, but his passion for coleoptery ensured that he became an active and enthusiastic scientist. He joined the crew of the Beagle as its on-board naturalist, and, during the course of this voyage, started to formulate his own ideas about natural processes. He had two close contemporaries, both of whom were lepidopterists: Alfred Bates, working in the Amazon, and Alfred Wallace, working in New Guinea. Both of these men had ideas of their own, and most of Darwin's conclusions were born from this cross-pollination. Interestingly, nearly all of his ideas were obtained from the breeding of domestic pigeons in his own backyard, and not (unlike Wallace and Bates) from observations in the wild. Darwin theorized that evolutionary change is driven by two factors: natural selection and sexual selection. Natural selection is discussed at length in the *Origin of Species*: he saw that this, acting on small variations within a species, would soon drive wedges between these varieties, and force them apart. The driving force here would be competition: in the unending battle for survival, competition forces specialization and niches. This sort of adaptation in its turn forces forks in the branches of the Tree of Life – a process known now as Adaptive Radiation. Thus, competition among slightly divergent forms of a species leads to new branches, radiating outward in all directions: Darwin called this his Principle of Divergence, with specialization being the key factor. Where a species loses the battle to another, this is called Competitive Exclusion; where a species changes a feature to avoid competition, this is called Character Displacement. A good example of this process can be found on the Galapagos Islands; on some of these islands, a large carpenter bee occurs, which competes with nectar-drinking finches; here, the birds have changed their diet, relying on nectar for only 5% of their food intake, as opposed to bee-free islands, where nectar intake is 20% of their diet. Furthermore, on those islands where they occupy this niche exclusively, their beaks are measurably smaller in size. Sexual Selection

was not discussed in Darwin's earlier works, such as *The Origin of Species*, as he at first did not accord it much weight. In his later work, *The Descent of Man*, he gave it recognition as an important force in nature. Sexual Selection, in a nutshell, amounts to those characteristics most sought after by females of a species, in selecting a mate. This can result in bizarre adaptations, particularly in the males of a species, as the Birds of Paradise amply illustrate. Sexual selection can be a powerful force in initiating the speciation process; as is well illustrated by the work undertaken by Dr Ken Kaneshiro on the courtship patterns of Hawaiian fruit flies (*Drosophila* spp.). These have speciated into more than 700 species throughout the Hawaiian Islands; often, the chromosomes of two species look almost identical, yet their genitalia are strikingly different. Sexual selection seems to drive these divergences, because all the sometimes bizarre sexual characters found in the males are used in some way during their complex sexual displays. The extreme genetic similarity of these flies suggests that these are very young species; if so, it appears that the pressure of sexual selection may sometimes act much faster than the pressures of environment in initiating speciation. For years, evolutionists have argued about sexual divergence, as they have about competitive divergence, and the arguments about the two processes are almost exactly parallel. Does the divergence in sexual taste occur while the species are separated by physical barriers, or do sexual tastes diverge when the varieties are neighbours?

From experiments, zoologists now know that there is variability from one individual to the next, both in sexual tastes, and in sexual characters. It has also been shown that these features are heritable, and that they are subject to powerful selection pressures that can produce rapid changes. Arrangements between males and females – once (like species) thought of as primary and immutable – are not permanent at all. Behaviour is the product of contending forces, struggling within each generation. The borders between species are continually being tested and redefined by the outcome of the sexual preferences of each new generation. Two Russians, Dobzhansky and Pavlovsky, have recently examined a complex of six populations of fruit fly (*Drosophila* spp.) distributed across Central and South America. Each population was not distinct enough to be regarded as a full species. Nevertheless, in the laboratory, females mated freely with males of their own incipient species, but seldom with males of another. When they did interbreed, they tended to produce fertile daughters and sterile sons. Even more surprising, a sample collected in the Llanos of Colombia was mated successfully with the Orinocan strain, then kept separate from them for five years. After this period, they failed to produce fertile offspring with any strain other than itself. Sexual selection therefore appears to be a more rapid and powerful process than has hitherto been thought. Frequently, sexual selection will reinforce natural selection, in

speeding up evolutionary processes. Sometimes, however, the two forces are in conflict, and this can produce confusing results. Thus, females of Endler's guppy (*Poecilia reticulata*) tend to select brightly coloured breeding males; but unfortunately so, too, do their predators. Therefore, where there is high predator pressure, the males of this fish are much more cryptic than where there is low predator pressure. When predator pressure is removed – as in a laboratory – cryptic males rapidly (within a handful of generations) become more brightly coloured. Darwin's Theory of Natural Selection has, in recent years, been elevated from a theory to a proven fact. Careful work done by scientists on one of the thirteen recognized species of Darwin's finches on Daphne Major, a small island in the Galapagos complex, showed that the beak size of that species altered rapidly with changing climatic conditions. During the 1970's, dry conditions favoured larger beaks, able to crack tough *Tribulus* seeds. From 1982, El Nino resulted in several abnormally wet years, resulting in an abundance of smaller seeds, and comparative scarcity of *Tribulus* seeds. Natural selection therefore favoured smaller beaks, and over that decade, the average beak size was reduced from 8,86 mm before El Nino, to 8,74 mm a decade later. Another good example of the speed of this process can be found in the European moth *Biston betularia*. The black form of this moth (aptly named f. *carbonaria*), was first discovered only in 1848, at which time the normal form was white. From 1870 onwards, this back mutant started to become more common in England, as an adaptation to increasing high levels of pollution. It was so successful in polluted urban areas that by 1950 it had become 90% dominant in larger centres, such as Manchester. By 1966, the English air began to clear through government action, and today f. *carbonaria* is in rapid decline.

## THE EFFECTS OF ISOLATION

Geographical isolation is the most obvious natural way of creating new variants – the first step in evolution. Often, however, barriers around species are invisible, because they are created by the creature's own behaviour. Once varieties begin to split off from one another, they need some way to keep themselves apart, and breed with their own kind only, otherwise the new line would soon disappear. Darwin's argument was that natural selection can arrange matches even better than the best human breeders, simply by choosing the fittest variants. It would improve their ability to tell one another apart as naturally and inevitably as it improves their ability to eat or fly. Selection will act this way simply because those individuals that make bad choices in their mates will suffer a mortal disadvantage: their offspring will be penalized in the survival struggle. There is therefore selection pressure to learn to discriminate. A good example of this can be found in the six different species of ground finches in the Galapagos; there

are no obvious differences in sexual display behaviour, and they all overlap in distribution. There are, however, some differences in birdsong and beak shape, and this generally prevents interbreeding.

## THE ROLE OF HYBRIDIZATION

Hybridization between species seems to be a topic little discussed among zoologists. In this regard, Darwin reflected the thinking of Linnaeus, and assumed that, since hybrids would produce non-viable offspring, it was not a factor in evolution. Today it has been shown that this approach is incorrect, and that the assumption concerning non-viable offspring should also be modified. In 1989, Russian ornithologist E. N. Papov noted that almost 1 000 out of the world's roughly 10 000 bird species have been known to hybridize. The incidence is particularly high among duck and geese species, with hybrids occurring among 67 out of 161 species. It has been estimated that one of out 60 000 wild birds is a hybrid. Hybridization is also common in toads of the genus *Bufo*, and among fish. In most cases, viable offspring are produced. Perhaps the most obvious examples of hybridization occur among plants, where the phenomenum is common. In certain circumstances, it operates to the advantage of plants, as they cannot move from their habitats, and their seeds often fall and sprout in adaptive landscapes that differ from those in which they themselves sprouted. In such cases, natural selection would favour great genetic variability, and hybridization is one way to achieve this quickly. Edgar Anderson, a botanist, made the point that the backcrossing of hybrids with the lines of either of the parents provides a means for the mixing of genes between the two lines, and so may be an important evolutionary step: he called this Introgressive Hybridization. Anderson argues that disturbances caused by humans on the planet are leading to increasing cases of hybridization everywhere, and that many of these hybrids and their habitats may prove to be the seedbeds of new evolutionary lines. For example, the San Gabriel mountains in North America have two species of sage; these do not hybridize in their natural habitat, the chaparral – but their hybrids flourish in disturbed habitats outside of it. This process was also noted by Dr Grant among Darwin's finches on Daphne Major Island in the Galapagos. Normally, hybridization between the two finch species on that island was selected against, both by nature and the birds themselves; but the occurrence of a rare catastrophe, such as El Nino in the 1980's, actively promoted such hybridization.

## CHANGES IN THE ENVIRONMENT

Darwin noted that changes in the conditions of life produced a tendency to increased variability, and so constituted an engine-room for evolution. For example, recent studies of *Escherichia coli* bacteria in the laboratory show that, in times of stress, colonies of bacterial cells in a Petri dish will start to mutate wildly. Many will even open pores in their membranes to take in DNA from outside their cell walls. This process is known as Transformation, and it can be stimulated by the stress of unfriendly chemicals. Environmental change, together with hybridization, may therefore constitute the primary driving force and catalyst for evolutionary change.

## DARWINISM AND SOUTH AFRICAN BUTTERFLIES

The variability necessary to initiate evolution is certainly evident among South African butterflies – particularly among the Pieridae and certain lycaenid genera.

Seasonal and regional variability is accepted as a matter of course among the Pieridae, where, in most cases, geographical isolation does not occur. Among lycaenid genera, however, geographical isolation has been a major factor, and this has led to a great deal of speciation, particularly among the genera *Thestor, Aloeides, Chrysoritis* and *Lepidochrysops*. Often, too, lycaenid species belonging to the same genus (such as *Aloeides*) may be found sharing the same habitat without interbreeding; they are good examples of sexual selection. In many localities up to five different species of *Aloeides* can be found on a single ridge or hill. In other cases, such as the *Chrysoritis* from the west coast of South Africa, or the *Tuxentius* from the Kalahari, so much variation occurs within a species that it becomes impossible to separate it conclusively from other closely-related species. This may be illustrative of one of two scenarios: first, either the species is an incipient one, not yet fully evolved – in which case it would still be able to interbreed freely with the allied species, as they are not yet separate. Alternatively, this is a case of a species which formed in isolation from its allied species during a particular climatic period, and then, as a result of climatic change, was able to expand its distribution, and hybridize with that other species – and so reverse the process. We now know, from only a few decades of study, how quickly certain butterflies can alter their geographical distribution, as a result of even temporary climatic changes. In cases such as these, pigeon-holing species into traditional Linnaean-type species categories is not only unrealistic, but misleading as well, as it does not correctly define their scientific relationship with sister species. The problem is that traditional Linnaean thinking did not allow for concepts such as species evolution and viable hybridization. However, these factors are scientific realities which we must factor into our taxonomic thinking. We

must learn to take into account the fluid and changing relationships that have always existed between species of animal and plant on our planet.

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# Common names revisited

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A while ago we wrote an article on common names for butterflies (*Metamorphosis* vol 7, No 3). With the development of LepiDops the need was again highlighted and we would like to raise the topic again for discussion.

LepiDops attempts to capture all current information of all species of Lepidoptera in the Afrotropical region. Unlike purists, of course, we believe that the common name of a butterfly/moth is as important as its scientific name. This is so because that is how the majority of people can relate to these insects. Indeed, when looking at the large number of 'birders' and their often very extensive knowledge of their topic one finds that the scientific name is almost a no-no. While not promoting this state of affairs we do believe that in an era where we are trying to educate the general public, this would be impossible if common names were neglected. As an example, the whole of South Africa is aware of the Brenton Blue, yet only a few select people know about *Orachrysops niobe*.

The creation of Africa-wide lists, of course, brings us before one of the many problems of common names, namely that the same species have different names in different regions or countries. Although advocated before, the birders seem to have beaten us to it and decided that these names should be assigned by decree rather than by history or emotion. Naturally, we should not neglect our past but we, as a society, have indeed been put in a position where we could take the lead and create something useful.

Before we tackle the actual issue it may be worthwhile to re-state the advantages and disadvantages of common names. Of course the biggest advantage of a common name is that the general public can relate to it. This is especially true if the name is descriptive. The second advantage is that by and large these names are immune to scientific boredom and thus do not change every time some scientist has a bee in his bonnet over which name is the oldest or which gene just doesn't look similar enough (as though 'similar enough' has ever been defined!).
In the disadvantage column one would have to list the duplication of names, the often not descriptive enough or erroneously descriptive names, the

multi-lingual problem of the region, the multitude of languages and so on.

At this point we would like to propose a set of rules for the giving of common names. Some of these rules are subjective and others may even lead to emotional stress for some individuals, but with good discussion we could possibly devise a good, practical set of rules. After all we are unencumbered by strict scientific protocols and indeed anyone can participate – you don't need a B.Sc. degree in zoology.

1. All species shall have an English common name. This is a pragmatic rule simply there to assist with intercultural, intercontinental and other inter... relations.
2. In a particular country a species should have a common name in all the languages spoken. While difficult to achieve, no limits should exist to encourage people to try and give names, identify and observe the species. A valid argument against this would of course be the clumsy publications that would follow, but we should of course wake up, this is the computer age and proper layout can easily be achieved to appease the reader, thus, if you're interested in Zulu names, that's what you'll see, etc.
3. Names should preferably be morphologically or behaviourally descriptive. While discoverers or family or girlfriends or even enemies could all be recognised in the scientific community with a scientific (Latinised) derivative of something, we believe that 'Millar's' this or Joe's that should be banned in common names. A Zulu farmer wouldn't care less about such names.
4. Where names are based on some traditional aspect, these should be kept if possible, but the tradition should be recorded. Explanations for common names, where not immediately apparent, should also be recorded.
5. Where duplications exist, feet-on-the-ground individuals from the regions should enter into discussion about resolution of the issue – it is not an issue worth killing over. Here LepSoc and its members could take a leading role in adjudicating.
6. Genus or genus groups should carry group names such as the swifts (*Borbo*), the foresters (*Euphaedra*, *Euriphene*), etc. This will help to keep common names at least linked to scientific definitions. It has to be realized that this often results in huge morphological differences, for example *Parinari curatellifolia* and *Parinari capensis*, the one a massive tree the other a little plant generally smaller than 200mm. The Afrikaans and English common names do achieve the goal though, Grysappel and Grysappeltjie or English: Mobola plum and Dwarf mobola.

7. Some descriptive names are problems or non-descriptive in some areas. These problems will generally only occur in widely distributed species. Thus, while *Papilio demodocus* may be common around Christmas time in South Africa this is not necessarily true in other parts of the region where Christmas may fall in winter. The name Orange dog is maybe too negative a name and not necessarily the best choice.
8. In general we would like to propose that names in different languages are translations of one another. This would assist in the general use of the name. It may be difficult to choose between "voëlent-witjie" and "dotted-border" but as common names are not yet commonly used this can be achieved with some degree of sensitivity.

Other questions that may be included in the rule set would include the question of whether the name could be related to immature stages or host-plant. Of course this is relatively easy for butterflies but what about moths? The only thought that we could offer is that we'd better get going as there is a long road ahead of us. Maybe we should start at genus level. Of course a study into the names that are actually used by indigenous folk may prove extremely exciting and who knows, we may discover some behavioural aspect that the scientific community was unaware of.

In conclusion let me also suggest that we do not start off too dogmatic but rather in a spirit of cooperation and tolerance. While we shopuld try to avoid it or at least minimize it these names can also be subject to change if we can define rules. For example, if a name is not descriptive across the whole region (and I guess where the species overlaps regions, other factors would also come to play) it could be changed. In time, if the rules are robust, a good set of common names can be devised for the benefit and enjoyment of everyone.

LepiDops has thus far adopted names from the 'Butterfly-list' of 1953, and various South African publications. Already some choices had to be made by the editors. With this article we would like to first of all encourage other regions to submit their common names but also, if no common names are submitted or duplications are found, it is proposed that new names be generated using the above guidelines. Anyone with an opinion on this matter is invited to raise it, preferably in open forum in *Metamorphosis*, but private correspondence is also welcomed. LepiDops currently uses two fields for common names, the first the English common name and the second a common name in the major common language of the country eg French in Côte d'Ivoire, Afrikaans in South Africa. (Indigenous languages are not neglected, just not available!). Other common names, where available, are simply captured in a list. Of course, any language can be surfaced to the main screen where it is desirable.

# Butterflies and skippers of Kgaswane Mountain Reserve (Rustenburg Nature Reserve), North West Province, South Africa.

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This 5 000 ha provincial nature reserve was surveyed over a period of five years (1998 to 2002). Eight weekend visits, covering the months of September to May, were conducted. As much ground and as many habitats as possible were covered on foot. Voucher specimens of butterflies and skippers were collected by means of hand-nets as well as banana-baited traps. When the oportunity presented itself an attempt was made to identify the larval foodplants of resident species.

A total of eighty-four species were recorded (seventy-three butterfly species and eleven species of skipper). None of the taxa that were found were unexpected in the Magaliesberg mountain range. Richard Newbery of North West Parks is thanked for sharing his enthusiasm for natural history, organizing accommodation, and for obtaining permission for us to work in the reserve. Place names in the reserve were obtained from a map of the reserve provided by the reserve authorities.

## FAMILY PAPILIONIDAE

***Papilio demodocus demodocus* Esper, 1798**

Abundant, especially in December and January, and widespread. Noted on every visit. Larvae on *Zanthoxylum capense* (Rutaceae).

***Papilio nireus lyaeus* Doubleday, 1845**

Common and widespread. Seen on each visit but scarcer in September, April and May. Larvae on *Zanthoxylum capense* (Rutaceae).

## FAMILY PIERIDAE

### SUBFAMILY COLIADINAE

***Catopsilia florella* (Fabricius, 1775)**

Occasional specimens seen on all visits; commonest in April. Most specimens were flying purposefully in a northerly direction (i.e. appeared to be migrating through the park. Larval foodplants were not noted and this species is probably not a breeding resident in the reserve.

***Colias electo electo* (Linnaeus, 1773)**

Occasional specimens seen towards the end of summer (March-April). Individuals were noted in damper habitats in the reserve, especially at the base of Langkloof.

***Eurema brigitta brigitta* (Stoll, 1780)**

Common to abundant, and widespread. Seen on each visit but scarce in September and abundant in March and April. Early stages found on *Chamaecrista mimosoides* (Fabaceae).

**SUBFAMILY PIERINAE**

***Pinacopteryx eriphia eriphia* (Godart, 1819)**

Occasional specimens seen in the lower eastern portions of the reserve. Noted on half of the visits.

***Colotis danae annae* (Wallengren, 1857)**

Only a single male was recorded (in December), in the lower eastern portion of the reserve. This specimen was probably a dispersant from a locality outside the reserve.

***Colotis euippe omphale* (Godart, 1819)**

Observed on less than half of the visits. Only a few specimens seen, usually associated with dense bush.

***Colotis eris eris* (Klug, 1829)**

Observed on less than half of the visits. Occasional but widespread. Several males and a female were seen on ridges on Sable Hill, in the north of the reserve, in April.

**C*olotis subfasciatus subfasciatus* (Swainson, 1833)**

Only encountered on one visit, in April, when several males and females were noted on Sable Hill.

***Belenois aurota aurota* (Fabricius, 1793)**

Occasional and widespread. Seen on every visit. Like *Catopsilia florella* this species probably just disperses or migrates through the reserve.

***Belenois creona severina* (Stoll, 1781)**

Relatively common and widespread. It was particulary common at the base of Bobbejaanskloof, where it breeds, as does *Belenois zochalia*, on *Maerua cafra* (Capparaceae).

***Belenois zochalia zochalia* (de Boisduval, 1836)**

Restricted to dense vegetation along streams, especially in kloofs. A number of specimens were found on mud at the bottom of Tierkloof. Commonest at the base of Bobbejaanskloof, where it breeds on *Maerua caffra* (Capparaceae). One worn female with yellow hind wings was noted, a colour pattern that is not supposed to occur in populations from the Magalisberg or Witwatersrand.

***Pontia helice helice* (Linnaeus, 1764)**

Occasional specimens were encountered in the grassy parts of the reserve at higher altitudes.

***Mylothris agathina agathina* (Cramer, 1779)**

Fairly common, and widespread. Seen on most visits.

## FAMILY NYMPHALIDAE

### SUBFAMILY HELICONIINAE

***Acraea anemosa* Hewitson, 1865**

Occasional specimens were noted in the lower parts of the reserve.

***Acraea horta* (Linnaeus, 1764)**

Occasional specimens were seen in kloof and riverine vegetation. A female at the base of Tierkloof was noted ovipositing on *Kiggelaria africana* (Flacourtiaceae), a known larval foodplant.

***Acraea neobule neobule* Doubleday, 1847**

Uncommon but widespread. Males were observed hilltopping, especially on Sable Hill, where a female was also noted.

***Hyalites encedon encedon* (Linnaeus, 1758)**

Only seen on one visit in April when several worn males were observed hilltopping on Sable Hill.

***Hyalites eponina* (Cramer, 1780)**

Common and widespread.

***Hyalites obeira burni* (Butler, 1896)**

A strong colony of adults was found, in January, in a rocky gorge (Tierkloof) opposite the waterfall on the Waterkloof Spruit. In April, at the same locality, a number of groups of fourth instar larvae were found on specimens of *Urera tenax* (Urticaceae) growing amongst the rocks, but there were no adults in evidence.

***Hyalites anacreon* (Trimen, 1868)**

A single female was noted flying on the banks of the stream at the bottom of Tierkloof where the tarred road crosses the Waterkloof Spruit. The larval foodplant, *Cliffortia linearifolia* (Rosaceae), occurs abundantly on the stream banks but no early stages could be located. Neither were further adult specimens seen.

***Hyalites rahira rahira* (de Boisduval, 1833)**

Abundant in the marsh at the head of the Waterkloof Spruit, the base of Langkloof, and in other marshy areas. Final instar larvae were found on *Polygonum* sp. (Polygonaceae) by Richard Newbery. Adults were commonest in December.

***Phalanta phalantha aethiopica* (Rothschild & Jordan, 1903)**

Occasional specimens were seen throughout the summer months, especially in the vicinity of riverine vegetation.

**SUBFAMILY SATYRINAE**

***Melanitis leda helena* (Westwood, 1851)**

A single specimen of the dry-season form of this butterfly was disturbed from its day-time roost in April. It was found in a donga about 300 metres north of the 'group campsite'.

***Henotesia perspicua perspicua* (Trimen, 1873)**

This is a common butterfly in the reserve but is restricted to shady riverine vegetation. It is commonest in Tierkloof, where adults were noted to be associated with clumps of the broad-bladed grass *Euchloa mossambicensis* (Poaceae), which is probably a larval foodplant.

***Ypthima asterope asterope* (Klug, 1832)**

On only one occasion several specimens were encountered, in March 2002, in the bushveld of the lower parts of the reserve.

***Paternympha narycia* (Wallengren, 1857)**

A few specimens encountered in grassy areas high up in the reserve, in December and January.

**SUBFAMILY LIMENITINAE**

***Neptis saclava marpessa* Hopffer, 1855**

Relatively common in well-wooded kloofs, especially Bobbejaanskloof at the Group Camp, where it breeds on *Acalypha glabrata* (Euphorbiaceae).

***Hamanumida daedalus* (Fabricius, 1775)**

This is a very common species, seen on every visit, in the lower altitude eastern portion of the reserve because of the abundance of their larval host-plants, mainly *Combretum zeyheri* and *C. molle* (Combretaceae). Males were seen to establish territories along the tar road, in patches of shade cast onto the road by large trees.

**SUBFAMILY CHARAXINAE**

***Charaxes candiope* (Godart, 1824)**

Common in riverine and dense bush in the lower parts of the reserve. Breeds on *Croton gratissimus* (Euphorbiaceae). Observed on most visits. Males were seen mud-puddling on more than one occasion.

***Charaxes jahlusa rex* Henning, 1978**

Adults were relatively common and were seen on about half the visits. Males were regularly seen hilltopping on 'Mandy's mound'. Probably breeds on *Pappea capensis* (Sapindaceae), a common tree in the lower parts of the reserve.

***Charaxes jasius saturnus* Butler, 1866**

Common, and observed on every visit. Males were often seen hilltopping. Three final instar larvae were found on a small specimen of *Burkea africana* (Fabaceae) in April.

**SUBFAMILY DANAINAE**

***Danaus chrysippus chrysippus* (Linnaeus, 1758)**

Common and widespread. Seen on every visit. Eggs and larvae were found on *Asclepias fruticosa* (Asclepiadaceae).

**SUBFAMILY NYMPHALINAE**

***Vanessa cardui* (Linnaeus, 1758)**

Relatively common and widespread.

***Hypolimnas misippus* (Linnaeus, 1764)**

Only found in April 1998 when it was common in the reserve. Large numbers of fresh males and females were noted feeding from the flowers of *Vernonia* sp. (Asteraceae) on grassy slopes in the park.

***Precis archesia archesia* (Cramer, 1779)**

Encountered on each of our visits to the reserve. Widespread in the reserve but not very common.

***Junonia hierta cebrene* Trimen, 1870**

Common to abundant, and widespread. Seen on every visit and was especially common in the later summer months (February to April).

***Junonia oenone oenone* (Linnaeus, 1758)**

Seen only once – a male was noted hilltopping on Sable Hill in April.

***Junonia orithya madagascariensis* Guenée, 1865**

Seen only once – a single specimen was observed in the marsh at the base of Langkloof in April.

***Catacroptera cloanthe cloanthe* (Stoll, 1781)**

Widespread but uncommon, in marshy and grassy areas, in the reserve.

**SUBFAMILY BIBLIDINAE**

***Byblia anvatara acheloia* (Wallengren, 1857)**

Only noted once, in April. A number of rather worn specimens were seen in the lower parts of the reserve.

***Byblia ilithyia* (Drury, 1773)**

Common and widespread. Noted on every visit, becoming progressively more common towards the end of summer.

## FAMILY LYCAENIDAE

### SUBFAMILY LYCAENINAE

***Myrina silenus ficedula* Trimen, 1879**

Single specimens were seen on three of the visits, always in Tierkloof. A female was noted ovipositing on *Ficus ingens* (Moraceae) in Tierkloof in December.

***Iolaus pallene* (Wallengren, 1857)**

A single specimen was observed in the Langkloof Valley on 25 September 1998.

***Iolaus trimeni* Wallengren, 1875**

A single male was noted hilltopping in the highest (south-west) part of the reserve in December. Several males were found hilltopping on Sable Hill in April.

***Iolaus bowkeri tearei* (Dickson, 1980)**

A single very fresh specimen was noted in the Newbery's garden (near the campsite) on 25 September, 1998.

***Hypolycaena philippus philippus* (Fabricius, 1793)**

Occasional specimens were observed, mainly in heavily wooded habitat, in the lower eastern parts of the reserve and at the base of Bobbejaanskloof.

***Deudorix dinochares* Grose-Smith, 1887**

Seen on two of the visits. In March a female was found in the campsite grounds and in April several males and females were noted feeding from the pink flowers of an exotic creeper planted below the balcony of the guest cottage in the valley on the east side of the reserve.

***Cigaritis natalensis* (Westwood, 1851)**

Adults were noted on one visit in April. Some were found feeding from the flowers of the creeper mentioned for *D. dinochares* (above) and a few were observed hilltopping on Sable Hill.

***Axiocerses tjoane tjoane* (Wallengren, 1857)**

Recorded on most visits. Only occasional specimens were encountered, mostly in the lower parts of the reserve. Several specimens were found feeding from the flowers of *Lippia rehmanni* (Verbenaceae) one April.

***Aloeides taikosama* (Wallengren, 1857)**

Several specimens were found in burnt grassland high up in the reserve, in late September. A single male was seen feeding from the flowers of the creeper mentioned under *D. dinochares* (above), in April.

***Anthene amarah amarah* (Guérin-Méneville, 1849)**

Relatively widespread and common. Males were most often encountered while they were mud-puddling.

***Anthene definita definita* (Butler, 1899)**

Common and widespread. Males usually found when mud-puddling. Appears to have adult emergence peaks in December and April.

***Anthene talboti* Stempffer, 1936**

A single male observed feeding on the pink-flowered creeper mentioned under *D. dinochares* (above), in April.

***Lampides boeticus* (Linnaeus, 1767)**

Occasional and widespread. Seen on most visits. Males sometimes found mud-puddling.

***Leptotes pirithous pirithous* (Linnaeus, 1767)**

Common and widespread. Seen on every visit. Males relatively common at mud-puddles.

***Tuxentius calice calice* (Hopffer, 1855)**

Relatively common and widespread. Commonest from January to April. Males were commonly observed mud-puddling.

***Tuxentius melaena melaena* (Trimen & Bowker, 1887)**

Common and widespread. Seen in all the summer months and males very common at mud-puddles.

***Tarucus sybaris sybaris* (Hopffer, 1855)**

Occasional and widespread, occurring in all the summer months. Males are very much attracted to damp spots and mud-puddles.

***Zintha hintza hintza* (Trimen, 1864)**

Fairly common and widespread. Seen on most visits. Occasional males found at mud-puddles.

***Zizeeria knysna* (Trimen, 1862)**

Occasional but widespread. Only seen on two of the visits. Breeds on a yellow-flowered *Oxalis* sp. (Oxalidae) that grows in moist grassy areas.

***Actizera lucida* (Trimen, 1883)**

Appears to be uncommon in the reserve – occasional males seen to mud-puddle.

***Zizula hylax* (Fabricius, 1775)**

Fairly common and widespread. Relatively common and widespread. Males often seen to mud-puddle.

***Azanus jesous jesous* (Guérin-Méneville, 1849)**

Common, especially from January to April, and widespread. Males often attracted to damp patches and mud-puddles.

***Azanus moriqua* (Wallengren, 1857)**

Only recorded once, in January. At this time occasional males were noted in mud-puddling assemblages.

***Eicochrysops messapus mahallakoaena* (Wallengren, 1857)**

Common and widespread. Seen on most visits. Occasional males were found mud-puddling.

***Euchrysops dolorosa* (Trimen & Bowker, 1887)**

Uncommon. Occasional males at mud-puddles.

***Euchrysops malathana* (de Boisduval, 1833)**

A few males were found mud-puddling on one visit in December.

***Lepidochrysops glauca glauca* (Trimen & Bowker, 1887)**

On a visit in April two males were observed, the one chasing the other, on the western ridge of Sable Hill.

***Chilades trochylus* (Freyer, 1843)**

Occasional and widespread. Seen on most visits. Males occasionally seen mud-puddling.

**SUBFAMILY MILETINAE**

***Lachnocnema bibulus* (Fabricius, 1793)**

In April a number of specimens were encountered in grassy areas in the valley on the eastern side of the reserve, particularly at the base of Tierkloof. In the latter locality they were flying together with *L. durbani*. Females of both species were observed ovipositing on the stems of various species of grass, apparently in the absence of homopterans (the normal diet for the larvae).

***Lachnocnema durbani* Trimen & Bowker, 1887**

See remarks for *L. bibulus*, above. A single male was noted in the marsh at the base of Langkloof on one visit in September.

## FAMILY HESPERIIDAE

**SUBFAMILY COELIADINAE**

***Coeliades pisistratus* (Fabricius, 1793)**

Common at lower elevations. Seen on about half of the visits. At the end of December on one visit numerous larvae were found on *Sphedamnocarpus pruriens* (Malpighiaceae), which grows abundantly in the lower parts of the reserve.

**SUBFAMILY PYRGINAE**

***Gomalia elma elma* (Trimen, 1862)**

Only two specimens were seen. The first was a male noted, in December, on the banks of the stream below the waterfall in Tierkloof. The second was a female, observed feeding from the flowers of a plant of the

hibiscus family (Malvaceae). This was suspected to be the larval foodplant but the female did not oviposit on it.

**SUBFAMILY HETEROPTERINAE**

***Metisella willemi* (Wallengren, 1857)**

Seen on most visits, between December and April. It was common on the shady banks of streams in the reserve.

***Tsitana tsita* (Trimen, 1870)**

Only seen once, in small numbers, at the end of December, on a high grassy slope devioid of shrubs or trees.

**SUBFAMILY HESPERIINAE**

***Kedestes wallengrenii wallengrenii* (Trimen, 1883)**

A single male was seen in the marsh at the headwaters of the Waterkloof Spruit on 21 December, 1997. No other specimens have been noted.

***Parosmodes morantii morantii* (Trimen, 1873)**

A single male, hilltopping on 'Mandy's mound', was recorded on 10 March 2002.

***Platylesches ayresii* (Trimen & Bowker, 1889)**

Widespread, but scarce, in rocky grassland where the larval foodplant *Parinari capensis* (Chrysobalanaceae) occurs.

***Platylesches neba* (Hewitson, 1877)**

As for *P. ayresii*. A final instar larva was found on *Parinari capensis* growing on the western slope of 'Mandy's mound' on 21 December 1997. This larva was collected and raised, a male emerging from the pupa on 21 January 1998.

***Borbo fallax* (Gaede, 1916)**

Only recorded once in January, a few specimens being observed in marshy areas with tall grass.

***Gegenes niso niso* (Linnaeus, 1764)**

Common and widespread. Seen on every visit. Specimens mostly frequented marshy areas with tall grass.

***Gegenes pumilio gambica* (Mabille, 1878)**

Fairly common, and widespread. Seen on less than half of the visits. Found in the same habitat as *G. niso niso*. One April numerous specimens were noted feeding on the flowers of a species of *Vernonia* (Asteraceae) on the slopes of Sable Hill.

# Letter to the Editor

Elaine Zwart of Durban is offering the following books for sale. These belonged to her late husband, Philip Zwart. She is also looking for a buyer for Philip's collection, which is representitive of most South African butterfly species (117 drawers). Elaine can be contacted on her cell at 083 619 4339.

*Butterflies of the Table Mountain Range, with comprehensive observations on their habits, times of appearance and life histories* – A.J.M. Claassens & C.G.C. Dickson.

*Trees of Southern Africa*. Keith Coates Palgrave. Struik, 1977.

*Life histories of the South African lycaenid butterflies*. G.C. Clark & C.G.C. Dickson, 1971.

*Pennington's butterflies of Southern Africa*. C.G.C. Dickson & D.M. Kroon (Eds]. AD Donker, 1978.

*Emperor moths of South and South Central Africa*. E. Pinhey.

*South African butterflies*. Trimen & Bowker (3 volumes). 1887-1889.

*Butterflies of Southern Africa*. G. van Son. Part 1 – *Papilionidae & Pieridae* (1970 Amsterdam reprint); Part 2 – *Danainae & Satyrinae* (1970 Amsterdam reprint); Part 3 – *Acraeinae* (1975 Amsterdam reprint).

*Butterflies of South Africa*. D.A. Swanepoel, 1953. With photograph and autograph of author.

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Manuscripts not conforming to the instructions below may be rejected and returned to the author. All manuscripts of scientific papers will be evaluated by at least one reviewer. Proofs will be returned to the author if necessary, and only printers errors may be corrected. Ten (10) offprints are provided free to the author or senior author on request, and only if the manuscript has been submitted on computer diskette in a word processing format that the editor/s are able to convert. Authors should contact the editor to enquire if the software that they are using can be converted by the editor, as the situation changes constantly. Additional offprint numbers can be ordered, at cost, at the proof stage.

A hard copy of the manuscript, and the originals of illustrations, and the computer diskette must be submitted to the editor. The text should be printed on A4 paper, with double lined spacing, and a margin of at least 2 cm on each side. The pages should be numbered consecutively, beginning with the title page, and including those carrying references, tables, and legends to figures. All figures and tables and references must be referred to in the text. If a computer diskette is not available, then tables are to be typed on A5 paper, exactly as found in the printed journal. To facilitate proper alignment of tables, or landscape orientation, even if a diskette is used, it would be appreciated if these can be arranged in A5 format (text dimensions having a width 4,5 inches and length 6,5 inches).

Figures must be boldly drawn in black waterproof ink, and arranged in clear and logical plates on stiff, white, preferably A4-sized board. All the figures must be numbered in a common sequence in Arabic numerals, irrespective of whether they are line drawings, photographs, diagrams, graphs or maps. Magnifications should be indicated by scale bars on the figures.

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Additional, expanded author instructions are available on request from the editor.

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ISSN 1018 6490