

of our old indices are simply the standardised measurement — in the example given sHL = CI (cephalic index) while sFW = FI (frontal index), sSL = SI2 (scape index-2), sHTL = HTI (hind tibia index), sPPW = PPI4 (post-petiole index-4), sESL = ESLI (propodeal spine index). If any other index is required it can be estimated from the mean values with very little loss of precision.

## Analyses

We used the 16 worker morphometrics (see above) standardised for size (dividing by HW) giving 15 size-standardised variates, thus for example, any differences between the standardised head-length (sHL) of individuals probably represents real differences in relative head shape. Principal Component Analysis (PCA), Discriminant Analysis (DA) and Canonical Variate Analysis (CVA) based on the correlation matrix between the standardised morphometrics were made using the MINITAB and GENSTAT statistical analytical packages. In brief, a PCA tries to combine the variates to create the same number of orthogonal Principal Components so maximising the distance between individuals in component space. Usually a large proportion of the total variance is captured by the first 2 or 3 components, so that the data can be summarised by 2 dimensional plots. A PCA makes no assumptions about prior groupings so that if all the specimens were simply drawn at random from the same population, one would expect no pattern in the PCA scores. DA and CVA work in a similar way on pre-defined groups, in this case looks for the discriminant functions that maximise between-group variance and minimise within-group variance. Discrimination can only be made if real differences between groups exist.

Analysis 1. A PCA was made of measurements of 77 specimens: group 1 comprised 17 workers of *M. indica*, including the lectotype and paralectotype, for which we had original measurements previously summarised by A. G. Radchenko and G. W. Elmes (1998: Table 2); group 2 comprised 30 specimens of the smaller form from the Makalu material that we believed might be a new species; group 3 comprised 30 specimens of the larger form from Makalu that we believed most probably was *M. indica*.

Analysis 2. As many as possible of the “old” specimens of *M. indica* (67) were re-measured and a PCA was made on their standardised morphometrics. This indicated three possible groups of “old” specimens, especially when geographic location of the specimens was noted.

Analysis 3. On the basis of the somewhat subjective visual grouping (analysis 2) the 67 specimens were assigned to one of 3 groups (called groups 1a, 1b and 1c) and a DA was made between the groups and the Discriminant Functions recorded. The latter can be used to calculate scores for new specimens from whom they can be assigned to the different groups with a known probability. The 60 Makalu specimens (groups 2 and 3) were thus assigned to one of the 3 groups of “old” specimens (1a-1c).

Analysis 4. We made a PCA on the combined data set of 5 groups (1a, 1b, 1c, 2 and 3) and when it was apparent that the Makalu groups were congruent with two of the groups of “old” specimens we made a final PCA of the three remaining groups. Finally, we looked for and found other consistent morphological differences between these groups (see taxonomic part of this paper below).

## Morphometric analyses

Analysis 1. The two first components (fig. 1) jointly account for about 50% of the overall variance, PC3 (not illustrated) accounts for a further 15% but add little extra information. Remembering that the effect of individual size has been more or less removed, it is at once apparent that the specimens comprising group 2 (putative sp. n.) generally have quite different shapes relative to group 3 (putative *M. indica*). However, group 1 (the 17 *M. indica* specimens) does not particularly overlap either of the two Makalu groups, some appear to cluster with group 2 and some with group 3, but many