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# The *Pollu* beetle in Andamans – do several lies make a truth?

In a recent issue of the *Indian Journal of Entomology*, Birah *et al.*[1] have attempted to defend the occurrence of *pollu* beetle, a pest of black pepper, in the Andaman and Nicobar Islands (A&N), India, as reported by them in an earlier article[2] in the same journal in 2011. Their most recent article[1] was in response to the counter to their first article by Prathapan[3] in the same journal, wherein he has critically reviewed the literature for the occurrence of the pest, found them wanting in understanding the pest damage, biology and nomenclature, faulted their methodology in assessing the damage and arriving at the insecticide dosage, etc. The authors' response[1] states that Prathapan's critical review made him conclude that the pest does not occur in the Andaman Islands. This admission of the carefulness of his approach is tantamount to accepting the conclusions made by him that the pest indeed does not occur in the A&N Islands. Further they add, 'All assumptions in this paper were based on earlier documentation.'[4,5] These two important 'earlier documentations', however, do not even find a mention in their original paper of 2011 and appear for their defence in their rejoinder after Prathapan's review[3]. However, they conveniently avoid making any mention of the meticulous work of their own Institute published as a research bulletin[6], which does not record the pest in the Islands. Thus (the paper of 2011) '... assumes that the berry damage is probably due to *pollu* beetle as had been earlier documented'. It is indeed surprising that a field experiment was carried out based on 'assumptions ... on earlier documentation' without verifying the veracity of occurrence of the reported insect, and also goes to the extent of stating 'assumes the berry damage is probably due to *pollu* beetle'. Their refuge and explicit authentication of their assumption is 'berry damage ... observed by its scientists (the authors of 2011 article) had been presented and reviewed in the Institute Research Council (ICAR-Central Island Agricultural Research Institute (CARI), Port Blair, A&N Islands) proceedings too'. While they bestow so much of faith only on some of the earlier works[4,5] as to make an 'assumption' of the pest's occurrence and 'damage probably due to *pollu* beetle', they seem to conveniently ignore some others[6] and strongly refute the claim of more recent work[3] stating that 'Perhaps (Prathapan's work) suffers from the required technical perfection to authentically rule out its non occurrence (in the islands)'. They further advocate in their conclusion that 'the occurrence of *pollu* beetle can thus be established only based upon a planned systematic study (on both spatial and temporal aspects) involving the beetle experts and entomologists working in the Islands who can monitor its field incidence throughout the year'. It seems rather strange that the very insect they claimed or rather 'assumed' to be causing up to 14.54%–18.56% berry damage[2] needs such a close and careful scrutiny to be even found to be present in the Islands.

The *pollu* (means hollow in Malayalam) beetle is the most important pest of black pepper (*Piper nigrum* L.) in Kerala and a few other parts of southern India, as the larvae directly infest the economically important part, the berry, and reduce the yield[7]. The common name of the pest derived from Malayalam has stuck (no other common names have been attributed to the pest in other languages), possibly indicating the limited distribution of the pest to parts of Kerala. Perusal of the literature since its first report[8] (as *Longitarsus nigripennis* (Motschulsky)) in 1919 also shows that the distribution of this insect is restricted to the southern Western Ghats and the adjoining plains in southern India[9], where pepper originated and is widely cultivated. Pepper has been later taken to several other areas in our country and is now mostly cultivated in the southern states, parts of North East India and A&N Islands[4]. The scientific name of the pest was changed in 2008 (to *Lanka ramakrishnai* Prathapan and Viraktamath, honouring the person who reported the pest first, Ramakrishna Ayyar[8]) according to some taxonomic nomenclature rules[9].

Distribution maps help one understand the species ranges and throw light on biogeography, species adaptations, species host range, phylogeny and the like, and are important from a biosystematics standpoint. Prathapan in this endeavour decided to look up the literature to understand the distribution of the *pollu* beetle that affects black pepper, on which he had already published a paper[9] in 2008, describing the error in identification and gave a new name to the pest, almost 90 years after its first report[8]. The record of the pest in the Islands[2] necessitated its mapping as present in the A&N Islands, while all other distribution records were in and around the southern part of the Western Ghats and the adjoining plains of South India. This was a little jarring and made Prathapan doubt its occurrence in the Islands. So he decided to investigate further and read the paper entirely and reviewed the literature about the pest carefully.

Some of Prathapan's findings and conclusions based on a review of the literature and surveys in the Islands resulted in a paper[3] published in the same journal in 2015. Following were some of his major conclusions in that paper:

1. There is no direct evidence of the occurrence of the pest in the Islands … three field surveys … no berry damage … during peak season of occurrence of the pest.
2. Bhumannavar *et al.*[6], recorded the insect pests of crops in the A&N Islands after confirmation of all identities by specialists and maintained voucher specimens, did not record the pest on black pepper.
3. Specimens of *pollu* beetle, if it was indeed collected, were never referred to a specialist for identification by Birah *et al.*
4. Photographic evidence of the beetle or any symptom of infestation on berries or leaves in the Islands is lacking.
5. The methodology given by Birah *et al.* for assessing the damage due to *pollu* beetle – separating the damaged berries and then assessing the loss on weight basis – is practically impossible.
6. Repeated requests for permission to examine the voucher specimens that may be present in the collections of CARI or visit the research farm of the Institute to confirm the presence of the pest and its damage were turned down[10]. No voucher specimen of *pollu* beetle is available in CARI.
7. The concentration of one of the insecticides (quinalphos) sprayed against *pollu* beetle by Birah *et al.* in the Andaman Islands was 0.5%, while the effective field dose of quinalphos is only one tenth (0.05%) of this dose for this pest[7].
8. This has led to a recommendation to the farmers of the A&N Islands – spray quinalphos twice a year – by the CARI (http://icar-ciari.res.in/technologies/blackpepper.pdf) and Department of Agriculture, A&N Islands (http://agri.and.nic.in/farm-practices.htm#BLACK PEPPER). Quinalphos is a broad spectrum nerve poison, classified as 'moderately hazardous' by the World Health Organization and this recommendation would thwart any idea of marketing organic pepper from the Islands, besides causing great harm to the fragile island ecosystem.
9. Birah *et al.* have claimed an increase in yield in the most effective pest management module to be an astronomical 206.05%–222.29% over the untreated check for a pest that is 'assumed' to be causing damage.
10. The work of Jayakumar *et al.*[5] published as a handbook on crop pests and disease of the islands by the Institute, in addition to finding a mention in its Annual Report[11], where they have recorded the *pollu* beetle as a major pest of black pepper with adults boring into the berries, has not been quoted in their publication. The study of Sadanandan and Nair[4], wherein the first mention of the pest as occurring in the Islands, is also not part of their literature review. The damage to the berries is actually caused by the larval feeding making the berries completely hollow, while the adults feed on the leaf lamina causing holes.

Unfortunately, the authors of the 2011 article and the Institute administrators have taken a stand of refusing even normal access to specimens, experimental fields and datasets to another researcher (Prathapan), despite several requests, expediently citing Intellectual Property Rights and Copyright[3,10]. This episode calls for a careful introspection by all, including scientists, institutions, funding agencies, journals, referees, editors, administrators, etc.

Transparency, openness and reproducibility are the vital features of science[12]. Implications of research misconduct are manifold and far-reaching[13,14]. Research misconduct shatters the very foundation of science, which is built on faith and honesty. Besides corrupting the scientific literature, it leads to wrong policies, wastage of resources and has the potential to significantly harm the society. A position statement adopted at the Second World Conference on Research Integrity in 2011 stipulates that 'Authors should abide by relevant conventions, requirements, and regulations to make materials, reagents, software or datasets available to other researchers who request them. Researchers, institutions, and funders should have clear policies to handle such requests'[15]. Research institutions should be responsible for the conduct of their researchers and investigations into possible misconduct should generally be undertaken by the researchers' institutions[15]. The Council for Scientific and Industrial Research, New Delhi has set a good example, by investigating the *PLoS ONE* episode involving researchers of the Institute of Microbial Technology, Chandigarh and informing the journal about the misconduct[16].

In a highly thought provoking article on self correction in science[17], there is a report about how Pamela Ronald (University of California, Davis, USA) did the right thing in retracting two papers, one from *PLoS ONE* and another from *Science*, after students in her laboratory found that one of the bacterial strains was mislabelled and also discovered that a protein assay they had used was not reliable. This article goes on to discuss various angles of such an action, but the opinion from another researcher (Jeffery Kelly, Scripps Research Institute in La Jolla, California, USA) on the issue of retraction/self-correction of flawed papers stands out – 'There is no other reason than one's ego not to correct something. The longer you let it go, the worse the problem gets. [If] you know your work is not right and others are struggling to repeat it, that's unconscionable.'[17]

It is surprising that the paper by Birah *et al.*[2] and the rejoinder[1], got into the pages of the *Indian Journal of Entomology*, one of the oldest science journals in the country. It is prudent, therefore, that Indian Council of Agricultural Research should tackle the problem of both sloppiness and deliberate misconduct across its vast national network of research institutes seriously.

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