

author to survey and study the type locality in 2006 and for five consecutive years till 2011, during the flowering and fruiting season (August–September), for fresh collections. However, it was noticed that there were no more individuals extant and the type locality was completely denuded. This was due to severe anthropogenic disturbances, such as clearing of the natural forest for development of picnic spots, grazing and cutting of roads, etc. As a result, the type locality got transformed into bare grassland with a dearth of rocks and rivulets that serve as natural habitat of the grass, and eventually its extinction in wild.

During the extensive floristic surveys, the authors inadvertently embarked upon a dwarf grass specimen from Kollur forest, near Souparnika River, in Mookambika Wildlife Sanctuary, Udupi district, Karnataka (13°42'–13°59'N lat. and 74°39'–74°50'E long.). The detailed morphological study and perusal of the literature revealed this to be the poorly



**Figure 1.** Habit of *Isachne mysorensis* Sundararagh.

known species *I. mysorensis* Sundararagh., strictly endemic to Karnataka. Its miniature size, concealed habitat within the fine rock crevices and broad ovate-chordate leaves were diagnostic characters (Figure 1). Embedded in the forest on the western edge of the Western Ghats, which comprises nine districts of Karnataka and six of Maharashtra, the current population is the only extant locality of the species as all other adjoining 15 districts were thoroughly surveyed and found to be devoid of any other population. The current population comprises 93 individuals occupying a small area of *c.* 2 m<sup>2</sup>. The small population amidst the natural forests of Kollur district is also exposed to severe threats due to anthropogenic disturbances such as forest clearing for developmental activities, grazing, setting fire for local destruction of dry fallen leaves and encroachment into the forest for broadening of roads, etc. A necessity for conservation of *I. mysorensis* is now urgently realized as it is already extinct in the altered type locality, currently extant and strictly endemic to the Kollur forest in Mookambika Wildlife Sanctuary. Hence this forest pocket within the sanctuary needs to be conserved as the natural habitat of the otherwise extinct miniature grass. Further, the narrow, restricted population size (93 individuals) calls for studies on reproductive biology with the aim of its multiplication under *ex situ* conditions and rehabilitation in the wild. The new locality reported here is almost adjacent to the type locality, which could possibly be within the normal seed dispersal range of the grass in the forest. It is also probable that the current population existed even when the type locality

was established, but went unnoticed as the Mookambika Wildlife Sanctuary remained taxonomically unexplored. The prospects of this locality being an extension of the type locality or vice versa, through two-way normal seed dispersal distance, cannot be ruled out. But under the present scenario, as the species has become extinct in the altered original type locality, the Mookambika Wildlife Sanctuary is the only extant locality of *I. mysorensis*, now categorized as critically endangered on the basis of critical population estimates.

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## River Sarasvati

Giosan *et al.*<sup>1</sup>, while commenting on Valdiya's article<sup>2</sup>, point out that sentences from another source have been misattributed to them by Valdiya. I want to clarify that I am the author of those sentences. Those sentences are from my blog post<sup>3</sup> on Harappan fluvial history published on 15 June 2012. I alone am responsible for them and that I have no connection with Giosan or his co-authors. Valdiya identifies S. Kalyanaraman, an active contributor to the 'India

Archaeology' forum, as his source of these sentences.

Taken in isolation these sentences may be construed as a criticism by me of all Indian geologists working on the Saraswati/Ghaggar river. On the contrary, my blog posts<sup>4</sup> on this issue have highlighted the work of Indian geologists studying this problem. Valdiya stresses<sup>2</sup> that hundreds of Indian geologists have been working on this problem for over 50 years. It is important to clarify that

not all of them agree with Valdiya's conclusions about the presence of a glacial Saraswati during Harappan times. Valdiya cannot speak for them or other independent studies, but he keeps using the words 'our conclusions' and 'we'. It appears that he has assumed the responsibility of speaking for all Indian geologists.

For example, Saini *et al.*<sup>5</sup> in their article on fluvial activity in Haryana do not speculate that sediments were deposited

by a Himalayan Saraswati river during the time period 6000–3000 BP. Valdiya, who is not a co-author comments<sup>2</sup>: ‘We believe that it was the Saraswati River originating in the Himalaya’. Saini and Mujtaba<sup>6</sup> in fact suggest that these sediments point to a source in the Siwaliks (and not in the glacial Himalayas). Valdiya does not refer to this more recent paper.

There is a further instance of misrepresentation by Valdiya. Pointing to a passage from Giosan *et al.*<sup>7</sup>, he writes<sup>2</sup>; ‘Interestingly, Giosan *et al.* (...) concede that... “the Yamuna may have contributed sediment to this region...” (Hakra–Ghagghar) “before the Mature Harappan Phase. For we recovered 5400-year-old sandy flood deposit at Fort Abbas (in Cholistan) Pakistan”...’.

This makes it seem that Giosan *et al.*<sup>7</sup> are suggesting that the Yamuna was flowing in this region around 5400 years ago. Here is relevant original text<sup>7</sup>; ‘Provenance detection (...) suggests that the Yamuna may have contributed sediment to this region during the last glacial period, but switched to the Ganges basin before Harappan times. The present Ghaggar–Hakra valley and its tributary rivers are currently dry or have seasonal flows. Yet rivers were undoubtedly active in this region during the Urban Harappan Phase. We recovered sandy fluvial deposits approximately 5,400 years-old at Fort Abbas in Pakistan (SI Text)...’.

Valdiya’s additions ‘before the mature Harappan Phase’ and ‘For’ have given the paragraph a different meaning than what the authors intended. Which rule of science publishing allows one to insert new words and phrases into the published text of some other author?

1. Giosan, L. *et al.*, *Curr. Sci.*, 2013, **104**, 285.
2. Valdiya, K. S., *Curr. Sci.*, 2013, **104**, 42–54.
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SUVRAT KHER

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### Response to Suvrat Kher

Suvrat Kher in his letter admits that he is the author of those sentences that generated misunderstanding between Giosan *et al.*<sup>1</sup> and myself. If Kher had such strong feelings about my writing on the Saraswati as expressed in the sentences he has put on his blog post, he could have communicated directly with me, for he has advised me to revise my works. I must confess that I do not have the ability and inclination to read the material posted on blogs.

I am aware that quite a few geologists hold views different from mine. When I used the words ‘we’ and ‘ours’, I understandably meant those who subscribe to the view that once the Saraswati flowed through Haryana, Rajasthan and Sindh. Having ploughed a lonely furrow all my life, I cannot have the immodesty and temerity of assuming ‘responsibility for all Indian geologists’.

Kher accuses me of misinterpreting the deduction of Saini *et al.*<sup>2</sup>, who clearly state that the sedimentary succession of the area between Tohana and Sirsa which is ‘considered as a part of the area’ through which the ‘lost’ Saraswati flowed (p. 1634), contains grey sandy facies with ‘grey sediments similar to the modern day sediments of the mountain-fed rivers’, ‘like Ganga and Yamuna’ (p. 1637) and ‘The mineralogical characters, extent and style of the grey micaceous sand suggests that it was a Himalayan mountain-fed multi-channel fluvial system.’ Taking in conjunction with the findings of Courty<sup>3</sup>, I concluded that this fluvial system belonged to the Saraswati.

Logical deduction cannot be construed as ‘misrepresentation’.

I know that Saini *et al.*<sup>2</sup> alluded to the river coming from the Siwalik. But the Siwalik is the Outer Himalaya. Moreover, in all my writings I have stated that the Himalaya-born Saraswati flowed through the Siwalik terrain between east of Paota Sahab and KalaAm.

I have correctly interpreted what Giosan *et al.*<sup>1</sup> have written in their article. The only error I committed was the wrong placement of quotation mark. I am sorry for this inadvertent mistake. But the meaning conveyed is the same as what Giosan *et al.*<sup>1</sup> intended.

I have not indulged in any misinterpretation or misrepresentation.

1. Giosan, L. *et al.*, *Proc. Natl. Acad. Sci. USA*, 2012; [www.pnas.org/cgi/doi/10.1073/pnas.11127431090](http://www.pnas.org/cgi/doi/10.1073/pnas.11127431090), Early edition.
2. Saini, H. S., Tandon, S. K., Mujtaba S. A. T., Pant, N. C. and Khorana, R. K., *Curr. Sci.*, 2009, **97**, 1634–1643.
3. Courty, M. A., *Museum of Technical University*, Lubbock, Texas, 1995, pp. 106–126.

K. S. VALDIYA

### Response to L. Giosan *et al.*

Giosan *et al.*<sup>1</sup> rightly protest the attributions I made in my article<sup>2</sup>. I sincerely apologize for the misattribution which was the result of a genuine error.

Giosan *et al.*<sup>1</sup> state that their ‘admiration for the Indian culture’ and their ‘interest for the history of the subcontinent is long-lived’, and that ‘they have the utmost respect for the Indian civilization and its achievements’.

The irony is that they<sup>3</sup> have not found ‘reliable enough’ works to be cited – even seminal works – of Indian authors who spent their lifetime on constructing the history of the Saraswati and the Harappa Civilization. Out of the 60 references in their list, only three Indian archaeologists figure, one of them being a co-author of the Giosan paper<sup>3</sup>. Only one paper on geology is cited, and the contributions of many authors in an edited volume are not mentioned, let alone discussed, even to contend their conclusions.

1. Giosan, L., Clift, P. D., Macklin, M. G. and Fuller, D. Q., *Curr. Sci.*, 2013, **104**, 285.
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3. Giosan, L. *et al.*, *Proc. Natl. Acad. Sci. USA*, 2012, **109**, E1688–E1694.

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