

four different spacing and fertilizer treatments. Harvesting was made at the time of crop maturity and a total of 36 seeds samples were collected for fatty acid analysis. The average oil content of the studied samples was 51%. The fatty acid composition of *Perilla* seeds was dominated by omega-3 and omega-6, ranging from 24% to 54% and 8% to 19% respectively, followed by oleic acid (5–13%) and palmitic acid (4–9%). Other compounds present in small amounts were lauric, myristic and stearic acids. The results of the study showed that *Perilla* oil was similar to linseed oil. On the contrary¹², other fatty oils such as sesame, soya and safflower were rich in omega-6.

Functional foods, nutraceuticals, pharmaco-nutrients and dietary integrators are all terms used commonly for nutrients or nutrient-enriched foods that can prevent or treat diseases. The high content of omega-3 fatty acids, absence of

mercury risk from fish sources and the beneficial effects of *Perilla* oil make it the best supplement to achieve balance in these valuable fatty acids. *Perilla* can help in diversifying the cropping system in the hills and can be a good crop for utilization of waste and under-utilized land of the hilly areas.

1. Anon., *The Wealth of India*, Publication and Information Directorate, NISCAIR, New Delhi, 2001.
2. Chauhan, N. K., Singh, S., Haider, S. Z., Lohani, H. and Kushwaha, B. L., *Natl. Acad. Sci. Lett.*, 2012, **35**, 91–93.
3. Longvah, T. and Deosthale, Y. G., *Food Chem.*, 1998, **63**, 515–523.
4. Kinsella, J. E., *J. Adv. Food Nutr. Res.*, 1991, **35**, 1–184.
5. Longvah, T., Deosthale, Y. G. and Kumar, P. V., *Food Chem.*, 2000, **70**, 13–16.
6. Harris, W. S., *Cleveland Clin. J. Med.*, 2004, **71**, 208–221.

7. Mbatia, B. N., Doctoral thesis, Lund University, Sweden, 2011.
8. Sayanova, O. V. and Napier, J. A., *Phytochemistry*, 2004, **65**, 147–158.
9. Asif, M., *Exp. Med.*, 2011, **11**, 51–59.
10. Butler, J., The fish report: why public health policy should promote plant omega-3 in preferences to fish oils, Vegetarian and Vegan Foundation, Bristol, 2009.
11. Mozaffarian, D. and Rimm, E. B., *JAMA*, 2006, **296**, 1885–1899.
12. Longvah, T. and Deosthale, Y. G., *JAOS*, 1991, **68**, 781–784.

NIRPENDRA CHAUHAN
S. ZAFAR HAIDER*
SHER SINGH
HEMA LOHANI

Centre for Aromatic Plants,
Industrial Estate, Selaqui,
Dehradun 248 197, India
*e-mail: zafarhaider.1@rediffmail.com

Sarasvati

We thank K. S. Valdiya for his interest in the Giosan *et al.*¹ study on the evolution of the Harappan fluvial landscape published last year in the *Proceedings of the National Academy of the United States of America (PNAS)*. Regrettably, in his article on the origin of the mythical Sarasvati² Valdiya attributes a series of quotes from another source³ to ourselves and our co-authors, which, we would like to believe, results from a confusion on his part that needs to be corrected.

We never wrote that a ‘geological narration constructed without rigorous evidence has been promoted to support a theory of cultural evolution in northwest India’, or that we suspect that one theory compared to another ‘had more emotional appeal and gained acceptance’ among Indian geologists. Or that previous work needs to ‘be revised or at the very least these geologists need to admit that their theory has been seriously challenged’. The sources of these comments are not our paper or communications, but are the comments of another individual on a personal blog³, who has no connection to ourselves or our co-authors.

We protested this false attribution where and when it was made (i.e. the discussion group ‘India Archaeology’⁴ and his caretaker S. Kalyanaraman quoted by Valdiya as his source of information). For example on 21 June 2012, Giosan

wrote to both venues: ‘There is NO such text in our paper (...). There are a lot of glosses on our work, some informed and some tendentious, so please read the text as published by *PNAS* before attributing any quotes’. However, Valdiya² still believes that Giosan *et al.* ‘accuse us (Indians) of having a dogmatic approach in constructing a narration on the Sarasvati prompted purely “on emotional appeal”’. The Giosan *et al.* paper is a scientific study and does not pass any judgement on Indian science, within whose ranks we count our collaborators. Our admiration for the Indian culture and interest for the history of the subcontinent is long lived, and we have the utmost respect for the Indian civilization and its achievements.

We are sure that Valdiya agrees that authors are only responsible for their work and opinions, and not for claims and interpretations made by others. We hope that Valdiya’s misattribution of quotes and his resulting misrepresentation of our intent² will be promptly corrected.

In the meantime, we are preparing a response addressing relevant scientific issues raised by Valdiya’s article and also invite him to send his critique to *PNAS*, the journal that originally published our work. We appreciate the considerable geological and archaeological evidence gathered by Indian colleagues

in northwest India and look forward to the opportunity for discussions toward an improved understanding of the Holocene fluvial landscapes in the western Indo-Gangetic Plain and how these relate to past human settlement and subsistence.

1. Giosan, L. *et al.*, *Proc. Natl. Acad. Sci. USA*, 2012, **109**, E1688–E1694.
2. Valdiya, K. S., *Curr. Sci.*, 2013, **104**, 42–54.
3. <http://suvratk.blogspot.com/2012/06/fluvial-history-and-fortunes-of.html>
4. <http://tech.groups.yahoo.com/group/India-Archaeology/>

LIVIU GIOSAN¹*
PETER D. CLIFT²
MARK G. MACKLIN³
DORIAN Q. FULLER⁴

¹Department of Geology and Geophysics,
Woods Hole Oceanographic Institution,
Woods Hole, MA 02543, USA

²Department of Geology and Geophysics,
Louisiana State University,
Baton Rouge, LA 70803, USA

³Institute of Geography and Earth
Sciences,

Aberystwyth University,
Aberystwyth, UK

⁴Institute of Archaeology,
University College London,
London, WC1H 0PY, UK

*e-mail: lgiosan@whoi.edu