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Effects of of Amalaki Rasayana and Rasa-Sindoor on neurodegeneration in fly models

In the recent years the load of neurodegenerative disorders has increased substantially. Most neurodegenerative disorders are associated with accumulation of aggregates of abnormal proteins in the central nervous system, which results in neuronal degeneration and ultimately neuronal death. Recent developments in molecular pathology and genetics have allowed the identification of the abnormal proteins involved in many neurodegenerative disorders and the genes that encode these proteins. During the last two decades, research using the genetically amenable fruitfly has established *Drosophila melanogaster* as a valuable model system to study human neurodegenerative diseases like Alzheimer's, Parkinson's, motor neuron diseases, as well as models for trinucleotide repeat expansion diseases, including ataxias and Huntington.

The effects of dietary supplement of Amalaki Rasayana (AR) and Rasa-Sindoor (RS) on neurodegeneration in fly models of Huntington and Alzheimer's diseases have been examined by Dwivedi *et al.* (**page 1711**). Both AR and RS feeding suppressed degeneration of photoreceptor neurons mediated by expression of pathogenic Huntington protein along with rescue of premature death of flies. The functional photoreceptor neurons in *Drosophila* model of Huntington disease were also restored. At the cellular level, either of these supplements substantially reduced the pathogenic polyQ protein aggregation along with the polyQ-stress induced Hsp70 and Hsp60. Cellular level of Hrp36 was substantially elevated after treatment with the formulations, which may contribute to the suppression of neurodegeneration. Interestingly, AR and RS feeding also partially reduced photoreceptor neuronal damage and increased the life span of flies overexpressing the pathogenic Aβ42 peptide in Alzheimer's disease model. These findings raise the possibility that therapy with Ayurvedic formulations may slow the progression of neurodegeneration associated with abnormal protein folding.

Iron pillar at Kodachadri

Kumar *et al.* (**page 1704**) have studied the iron pillar located in Adi-Mookambika temple at Kodachadri in Karnataka. Although several studies have been reported on the iron pillars at Mehrauli (Delhi) and Dhar (Madhya Pradesh), the iron pillar located in Adi-Mookambika temple has not received much scientific attention so far, because the Kodachadri is difficult to reach and also because the pillar itself is not as massive and imposing as the Delhi and Dhar monuments. The iron pillar is 8.7 m high with almost square cross-section and an average perimeter of 27.5 cm. The surface of the pillar is not as smooth as those at Delhi and Dhar. The top 1 m of the pillar shows excessive corrosion, especially on the surface facing west towards the Arabian Sea. The *in situ* metallography at various locations on the pillar and scanning electron microscopy on a small sample from the pillar clearly established that the iron is produced by the age-old indigenous solid-state reduction process that is used for making the so-called *Adivasi* (tribal) iron. The microstructure essentially consists of ferrite, or ferrite with varying fractions of pearlite along with slags and iron oxide entrapments. Presence of slip lines in the microstructure at various locations indicates heavy forging of the iron pillar. The phosphorus content in the iron pillar is found to be much less than those reported for the iron pillars at Delhi and Dhar.

Multimodal signalling in foot-flagging frog

The Small Torrent Frog (*Micrixalus* aff. *saxicola*), a diurnal frog endemic to the Western Ghats of India, displays advertisement calls, foot-flagging and tapping (foot lifting) behaviours during male–male agonistic interactions to signal the readiness to defend perching sites in perennial streams. Preininger *et al.* (**page 1735**) have performed a quantitative video analysis of male–male interactions and highlight that the

conspicuous visual displays were used as directional signals toward the opponent male, but were less abundant than male advertisement calls. The acoustic and visual signals were not functionally linked; the call thereby did not act as an alert signal. Analysis of behavioural transitions revealed that kicking behaviours (physical attacks) significantly elicited kicks from interacting males. The authors suggest that the visual signal ritualized from this frequently observed fighting technique to reduce physical attacks and represents a nascent state in the evolution of foot-flagging signals in anurans.