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Phytolith analysis on the intrabasaltic red boles (palaeosols) and modern soils from the Koynanagar region of Maharashtra (India): Implications for the palaeoclimatic reconstructions.

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The ancient intrabasaltic red boles (Deccan Trappean age) along with the lateritic and modern soils (Holocene age) from the Koynanagar region of Maharashtra (India) were studied for their phytolith contents which show significant variations as far as the climatic conditions of their formations. The analyses were carried out by calculating Climate Index (Ic), Phytolith Index (Iph) and Cold/Warm ratio (C/W) using the phytolith morphotypes present within the soils. High values of Ic point to a cool climate; high Iph values indicate aridity (reduced precipitation) while high C/W ratio suggests cool and dry milieu during the soil genesis. For this climatic analysis the peculiar shapes of various phytolith remains after variety of grasses of different subfamilies were identified, e.g. *Panicoidea* type of grasses produces dumbbell and cross shaped phytoliths (warm and moist climate); *Festucoidea* grasses produce rondel and trapezoid shaped phytoliths (cold and dry climate) while *Chloridoidea* grasses yield short-saddle shaped phytoliths (warm and dry climate). A remarkable fluctuations in the values obtained for Ic, Iph and C/W ratio indicate quite variability in the climatic conditions of their formation, especially for the red boles. The phytolith counts; their assemblages and calculated values of Ic, Iph and C/W ratios from the different profiles suggests that the red boles mostly indicate cool climate (with high Ic and C/W values) though variable. Modern soils seem to have formed under mostly warm and humid conditions (with low Ic and C/W values), while the lateritic soils show high Ic and C/W ratio indicating climatic conditions quite similar to those for the red boles. The inconsistencies in the Iph values indicate quite variability in the amounts of rainfall during the formation of ancient red boles as well as recent soils of Holocene age.

