# Oral presentation
# Session I

## Is sensitivity to xylem cavitation a relevant physiological trait for fodder production in dry season?

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### Abstract

In the Sahel parklands, trees can provide fodder during the dry season if they keep functional foliage. In such conditions, the xylem vessels sustain high tension which can induce cavitation, decrease the conduction of sap and lead to branch mortality. Therefore, xylem resistance to cavitation is a good index of tree tolerance to water stress. However, information about this parameter remains scarce in Sahel tree species. Moreover, its measurement is difficult and requires equipment limiting its feasibility in field conditions.
To measure the vulnerability to xylem cavitation in 10 tree species with fodder potential in North Senegal and to assess if this ecophysiological trait can be correlated to morphological traits that are easier to measures: wood density, xylem anatomy, and vessel length.
Branch samples were collected in parklands in Louga region, Northern Senegal. Wood density and xylem anatomy were determined. Branch sections were wrapped to keep wet and sent to France within 1 week. The Cavitron spinning technique was used to construct cavitation vulnerability curves and to compute the P50 (water potential inducing 50 % loss of conductivity). Vessel length was assessed by flushing air at low pressure through gradually shortened branch sections.

The Cavitron spinning technique was not relevant on nine out of ten species. Most vulnerability curves had a sharp increase in loss of conductivity, starting at low water stress. The resulting P50 which were not consistent with water potential measured in the field. All this species but *Tamarindus indica* had xylem elements longer than the device rotor. They were severed during measurement, inducing artificial loss of conductivity. Only *Boscia senegalensis* showed correct curves, and revealed very resistant to cavitation (P50 = -7.9 Mpa). Wood densities ranged between 0.41 – *Adansonia digitata* – to 0.71 – *Acacia tortilis*. P50 estimated from these densities were between – 2 and – 6 MPa.

Vulnerability to xylem cavitation could not be assessed by the spinning technique 'Cavitron', due to long xylem vessels elements in most the species. The probable low vulnerabilities estimated from high wood densities could be corroborated by xylem anatomy.