Riparian ecosystem services: Akimel O'otham ethnomedicinal use of riparian plants

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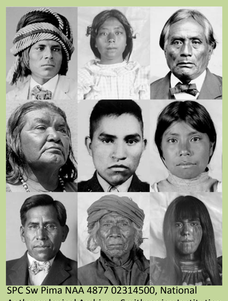
Introduction and Objectives

Research on local Indigenous knowledge of introduced plants has been given little attention. Plant knowledge of Indigenous people has primarily been associated with native species found within their homelands. The Salt River in the arid Sonoran desert region located within Phoenix, AZ provides habitat for many native and introduced woody plants, providing an opportunity for study.

National Health Interview Surveys suggest Complimentary and Alternative Medicine (CAM), inclusive of botanical and herbal treatments (Rx) from Indigenous Traditional Practitioners and Heiberos, has increased nationwide (Barnes et al. 2008). The Akimel Au-A'uthm (aka Akimel O'otham (AO)) encompasses three Indigenous communities: Salt River Pima Maricopa Indian Community, Gila River Indian Community, and Ak-Chin Indian Community.



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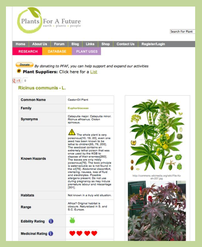
Objectives:

- Determine whether the potential ethnobotanical use (primarily medicinal use) differs between native and introduced woody plants in riparian zones
- Determine whether the native/introduced plants are both used to a similar extent by the local Indigenous AO.

Methods

We inventoried sites along the Salt River (near Phoenix) and also queried SEINet to determine the identity of woody plants growing along the river. Many of these plants also grow along the Santa Cruz River.



To determine medicinal uses:

- University of Michigan's Dearborn Native American Ethnobotany Database
- New Mexico State University's Medicinal Plants of the Southwest (MPSW) Database
- Cornwall, England's Plants For a Future Use Database.
- Journal publications were reviewed for additional ethnomedicine evidence, primarily for introduced plants.

We obtained published information shared by AO, Tohono O'odham, and Pima Bajo elders. Their names are Rosita Brown, David Brown, Joseph Giff, Ruth Giff, Sylvester Matthias, Carmelita Raphael, George Kyyitan, Francis Vavages, Irene Hendricks, Sally Giff Pablo, Myrtel Mails Harvier, Herbert Narcia, Frank Jim, Pedro Estrella Tanori, and Maria Cordoba, who account for the majority of AO recorded CAM Rx purposes (Rea, 1997).

Literature Cited

Barnes, P. M., Bloom, B., Nahin, R. L., & National Center for Health Statistics. (2008). *Complementary and alternative medicine use among adults and children*. Hyattsville, MD: U.S. Dept. of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics.

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Rea, A. M. (1997). *At the desert's green edge: An ethnobotany of the Gila River Pima*. Tucson: University of Arizona Press.

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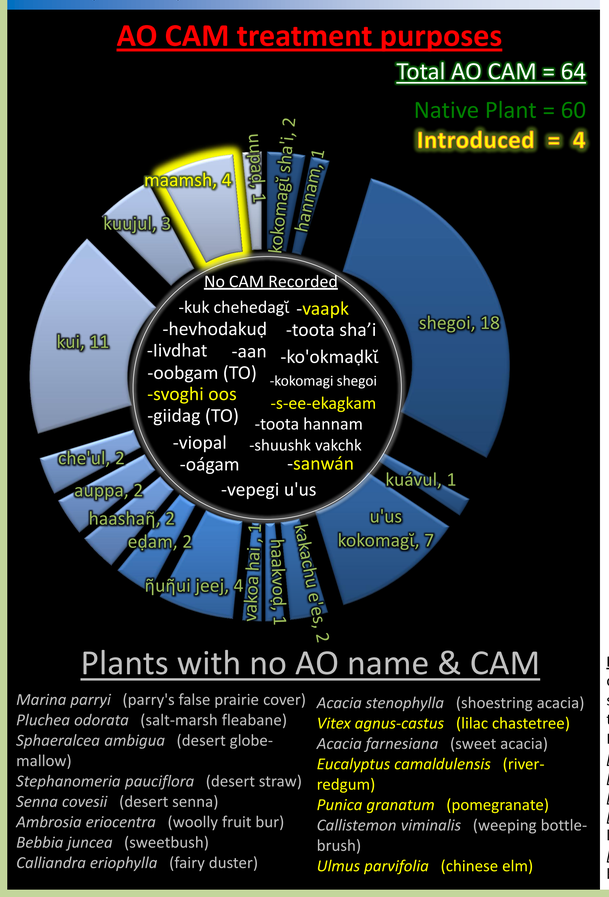
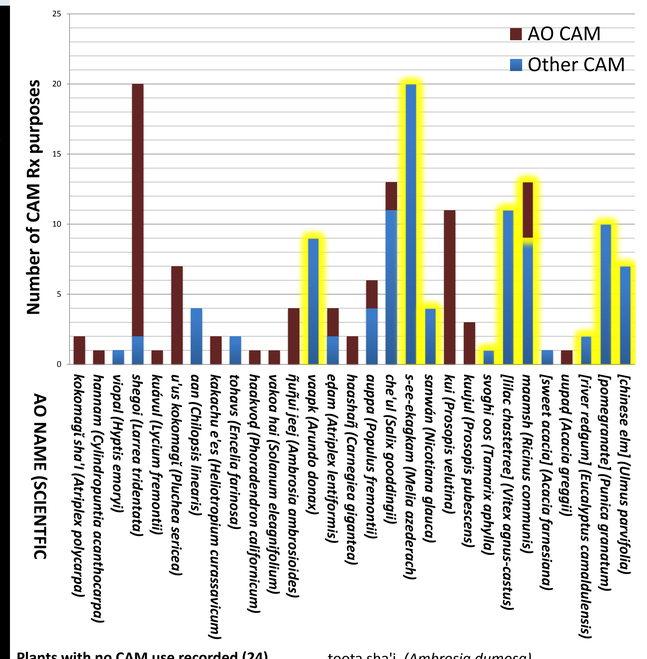
Results:



Plants with no AO name & CAM

Marina parryi (parry's false prairie cover)
Pluchea odorata (salt-marsh fleabane)
Sphaeralcea ambigua (desert globe-mallow)
Stephanomeria pauciflora (desert straw)
Senna covesii (desert senna)
Ambrosia eriocentra (woolly fruit bur)
Bebbia juncea (sweetbush)
Calliandra eriophylla (fairy duster)
Acacia stenophylla (shoestring acacia)
Vitex agnus-castus (lilac chastetree)
Acacia farnesiana (sweet acacia)
Eucalyptus camaldulensis (river-redgum)
Punica granatum (pomegranate)
Callistemon viminalis (weeping bottle-brush)
Ulmus parvifolia (chinese elm)



Plants with no CAM use recorded (24)

oágam (*Baccharis salicifolia)*
shuushk vakchk (*Baccharis sarothroides)*
toota hannam (*Cylindropuntia fulgida)*
livdhat (*Hymenoclea salsola)*
[parry's false prairie cover] (*Marina parryi)*
[salt-marsh fleabane] (*Pluchea odorata)*
[desert globe mallow] (*Sphaeralcea ambigua)*
[desert straw] (*Stephanomeria pauciflora)*
livdhat (*Hymenoclea monogyra)*
[desert senna] (*Senna covesii)*
kokomagi shegoi (*Ambrosia deltoidea)*
toota sha'i (*Ambrosia dumosa)*
[woolly fruitbur] (*Ambrosia eriocentra)*
[sweetbush] (*Bebbia juncea)*
[fairy duster] (*Calliandra eriophylla)*
[shoestring acacia] (*Acacia stenophylla)*
hevhodakuḍ (*Washingtonia filifera)*
oobgam (TO) (*Parkinsonia aculeata)*
ko'okmaḍkĭ (*Parkinsonia florida)*
kuk chehedagĭ (*Parkinsonia microphylla)*
vepegi u'us (*Tamarix ramosissima)*
giidag (TO) (*Acacia constricta)*
[wheeping bottlebrush] (*Callistemon- viminalis)*

We identified 52 woody plants, 12 introduced and 40 native. 29 plants, 9 of them introduced species, had at least one CAM Rx purpose. 20 CAM purposes were recorded for S-ee-ekagkam (*M. azederach*) & Shegoi (*L. tridentata*).

S-ee-ekagkam's CAM Rx purposes came from other people such as in India and the Cherokee, but not from AO.

Shegoi (*L. tridentata*) had 18 different AO uses including topical analgesic and febrifuge. The introduced Maamsh had recorded use as a laxative, analgesic, cathartic, and derma-aid.

18 plants (3 introduced species) had AO names but no recorded CAM Rx use. 15 plants had no AO name & no CAM Rx use. A total of 24 plants had no Overall CAM Rx use.

Conclusions

Out of 52 woody plant species in the Salt River Phoenix urban riparian zone:

- Total of 29 (9 introduced) had at least one form of CAM Rx purposes.
- AO CAM accounted for 17 of the 29 plant species with an Overall CAM Rx purpose.
- 1 introduced plant was used for AO CAM Rx purposes, compared to 8 introduced plants with Overall CAM Rx purposes.

AO CAM accounted for 64 of the total 164 Overall CAM Rx purposes, with 9 introduced plants having a total of 73 CAM Rx purposes. This indicates that CAM Rx uses, especially for introduced species, was yet to be fully developed by Indigenous AO. The medicinal purposes of introduced plants were not completely unknown though to AO. Sylvester Mathias says this of the introduced Maamsh, "They warn us not to eat Castor-Beans, it's not for eating anyway; it's used for medicine" (Rea, 1997).

Future Research:

- New community-led surveys would be useful for learning how usage and knowledge has changed since 1997.
- Help to understand whether there has been ongoing active learning about previously unknown/introduced plants or preparation methods (Geniusz, 2009).

Che'ul; *Salix gooddingii;* Goodding willow (Salicaceae)

Kui; *Prosopis velutina*; velvet mesquite (Fabaceae)

***Melia azedarach;* chinaberry tree (Meliaceae, mahogany family)**

Maamsh; *Ricinus communis;* Castorbean (Euphorbiaceae)

Acknowledgments

- Ahéhee' Nanise', which are beings of medicine according to my Indigenous Diné teachings (Allan).
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