

Bridging Ethnobotanical and Traditional Knowledge with Chemical Structure Innovation

TERRESTRIAL ECOLOGY & SOURCING

Rather than employing broad-scale industrial harvesting which risks soil degradation and forest loss, the present framework utilizes targeted ethnobotanical screening in Southern Mozambique, in order to preserve vulnerable ecosystems and to respect **Life on Land (SDG 15)**.



Sustainable Sourcing Strategy:

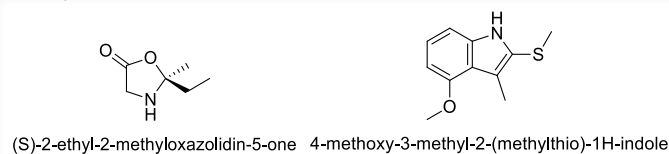
- > **Zero Hunger (SDG 2):** Preserving food-security plants in local regions.
- > **Non-Destructive Sourcing:** Extracting only leaves/twigs to shield roots.
- > **Traditional Mapping:** Promoting conservation in native communities.

SCREENED MOZAMBIKAN TAXA

Species (Family)	Niche / Role	Traditional Use
<i>Cadaba natalensis</i> (Capparaceae)	Wild Forest Undergrowth	Tuberculosis, Parasites
<i>Clematis viridiflora</i> (Ranunculaceae)	Endemic Creeper System	Skin Pathogens, Pains
<i>Brachylaena discolor</i> (Asteraceae)	Semi-Arid Land Anchor	Malaria, Gastrointestinal

GREEN CHEMICAL SYNTHESIS (SDG 13)

A critical threat to life on land the over-harvesting of wild populations. The present work will tackle this by charting biomimetic chemical pathways to synthesize isolated novel compounds (such as oxazolidines, quinone methide, and sulfur indole) inside clean laboratories.



Structural Breakthroughs

Successfully mapped and elucidated two novel chemical entities representing unique biosynthetic adaptations:

- (S)-2-ethyl-2-methyloxazolidin-5-one: Discovered in *Cadaba natalensis* roots. First reported instance of this natural heterocyclic 5-one ring system in terrestrial flora.
- 4-methoxy-3-methyl-2-(methylthio)-1H-indole: Isolated from *Clematis viridiflora* leaves, characterizing an unusual sulfur-containing indole ring substitution.

SDG 11 Alignment (Sustainable Communities): Protecting regional biodiversity preserves the natural cultural heritage of Mozambique, honoring indigenous wisdom while upgrading synthetic capacities.

PROTECTING THE HYDROSPHERE

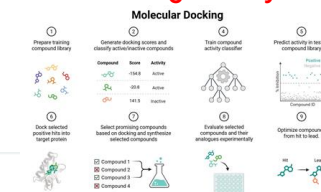
Synthetic drug and pesticide run-offs severely damage marine biomes. Developing organic, biodegradable natural phytotherapeutics avoids the accumulation of persistent chemical toxins in local rivers and oceans - **Life Below Water**.

Antiprotazoal Efficacy Profiles (IC50 Values):



*Lower IC50 represents superior biological activity. Safe, degradable components reduce chemical footprints in aquatic ecosystems.

Molecular targets & Synthesis



Biomimetic total synthesis: Reproducing the oxazolidine ring and sulfur-substituted indole metrics inside microbial factories to shield Mozambique's vulnerable native populations from destructive over-harvesting

CONCLUSION

Rather than employing arbitrary screening methods, this research has leveraged traditional ethnobotanical indicators in Southern Mozambique to selectively prioritize species. This targeted approach has resulted in isolation and characterization of 40-metabolite, some of them with structurally unique templates..