Valuing possibilities for *Amorpha fruticosa* L. populations found in Romania

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Amorpha fruticosa L. (false indigo, river locust) was used in Romania for degraded land reclamation due to its adaptability in poor site conditions.  
• it is found along the Danube River and main tributary river floodplains;  
• the species great ecological amplitude turned it invasive especially in wetlands with negative impact on protected areas (e.g. Natural Parks, Natura 2000 sites).

Figure 1. Protected areas where Amorpha fruticosa L. is abundant (Dumitrascu et al. 2013)
• *A. fruticosa* covers large areas quickly (especially where seasonal flooding occurs), and competes for space and nutrients with native species (e.g. willow, poplars). - has a negative impact on the natural regeneration process of native forest habitats.

Figure 2. False indigo under white poplar regeneration in Small Wetland of Braila Natural Park (Photo: Ciuvat L.)
Proposed solutions

• After consulting the available bibliography on false indigo, the published results were structured in three separate categories of possible uses: *medicinal, food and industrial*.

• *land reclamation use was not taken into account* as it implies increasing the spread of the species.

❖ *Medicinal uses*

• the **fruits** (pods) and stems are the parts most studied for medicinal uses;
• new rotenoid glycoside extract has **effect on the growth of human immune cells**;
• besides rotenoid and flavanon compounds with **antimicrobial and anticancer properties**, the volatile oil extracted from the seeds manifested moderate antibacterial activity against Gram-positive bacteria (e.g. *Staphylococcus aureus*, *Sarcina lutea*, *Bacillus cereus*, *B. subtilis*) highlighting **wound healing properties**;
• new extract with antioxidant activity proves useful in **therapy of free radical pathologies and neurodegenerative disorders** (e.g. Alzheimer) and diabetes;
• potential use for the **mammalian cell culture media formulation** by replacing the animal serum and as green **alternative to existing synthetic corrosion inhibitors**.
Food uses

• food additives like natural colorants or as a spice;
• false indigo has a high melliferous potential. (products like honey, pollen and propolis, have high nutritional value);
- Blooming (abundant) occurs in late May - early June with a long flowering period of 20-25 days, and reported quantities range between 55 kg (age 6) and 113 kg (age 9) of honey per 1 ha.
• the honey is reddish in colour with mild taste and fragrance;
• the species can be an alternative forage source for game (e.g. pheasants eat seeds) and fodder for livestock (e.g. sheeps and goats eat the leaves)
small locust has a high second-year leaf concentration, averaging 660 g kg\(^{-1}\) DM;
• fodder quality is high, with average crude protein (CP), acid detergent fiber (ADF), and neutral detergent fiber (NDF) concentrations in July of 205, 226, and 235 g kg\(^{-1}\), respectively.
Industrial uses

The resinous pustules located on the plant (fruits, leaves, root) contain chemical substances (‘amorpha’) that can be used for insecticidal or insect repellent purposes;
• potential use in pharmaceutical industry (e.g. natural mosquito repellent);
• false indigo biomass use benefits:
  - widen the range of forestry products
  - reduce the cost of forest regeneration
  - offer additional income possibility to rural communities from harvesting the false indigo;
  - used as fuel for biomass power plants;
• dry biomass production varies from 7.28 t/ha to 12.18 t/ha, with moisture less than 35%, ash content of 1.5%, and calorific value of up to 16.9 MJ Kg$^{-1}$;
• very suitable for pellet production.

Figure 6. Harvesting false indigo (Photo: Csaba Vaszko, Source: WWF)
Conclusions and Discussions

• In Romania the species is appreciated for its high melliferous potential;
• new research in medicine (national and international) for developing natural remedies and other green technologies (e.g. corrosion inhibitors).
• Valorisation of species benefits can be realized in three different stages:
  - first stage: pollen collecting for honey production (in spring);
  - second stage: fruit gathering for medicinal purposes (during autumn);
  - third stage: harvesting of biomass for industrial use (during winter).
• False indigo covered areas can be managed as short rotation crops (SRC) for biomass, with a harvesting cycle of 1 to 3 years depending on site conditions.
• Harvesting technology required is similar to that used for common reed.

Significant areas covered by *Amorpha fruticosa* L. in Romania require a sustainable control that can be achieved by valuing its biopotential.
BIBLIOGRAPHY


THANK YOU FOR YOUR ATTENTION

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