A traditional burn wound treatment (especially used in the Ohio/Pennsylvania regions by the Amish) using Arctium spp. (burdock), has been associated with diminished pain, reduced skin grafts, minimal scarring, few bacterial infections, and decreased healing time. This study investigated the potential antimicrobial and cellular effects of burdock. Growth inhibition assays analyzed the antimicrobial activity of 8 accessions of burdock against prevalent burn wound colonizers: Staphylococcus aureus, Staphylococcus epidermidis, Escherichia coli, and Pseudomonas aeruginosa. Burdock demonstrated the most antimicrobial activity against S. aureus, followed by S. epidermidis and E. coli. There was significant variation of inhibition between bacteria, but minimal variation among burdock accessions or species. Cellular effects were studied through yeast genome expression profiles using microarray hybridization, but incomplete results limit further speculation at burdock’s potential role in inflammation and tissue regeneration. Moreover, it is suggested that burdock leaves, a honey salve, and the body work together to provide protection against invasive microbes and to help promote cellular regrowth.

**Key questions and Experimental Approaches**

**Question:**
1. Is burdock acting as an antimicrobial?
2. Does the presence of burdock have cellular effects on wound healing?

**Approaches:**
1. Monitor the inhibition of bacterial growth in the presence of burdock
2. Monitor changes in yeast gene expression in presence of burdock

**Antimicrobial Assays**

![Antimicrobial Assays](image1)

Figure 3. Experimental Approach. Various strains of bacteria were plated on TSA media to ensure lawn growth, filter discs with burdock and the control discs were placed on the media and incubated overnight. The zone of inhibition (or clearing of bacteria caused by an antimicrobial from the disc) was measured as the average of three radii. A larger zone corresponds to a more effective antimicrobial effect.

**Conclusions from Antimicrobial Assays**

- Burdock does act as an antimicrobial to inhibit the growth of common burn wound colonizers: *S. aureus*, *S. epidermidis*, and *E. coli*, but it has a weak effect.
- Burdock does not effect Gram-negative *P. aeruginosa*.
- Effectiveness of burdock as an antimicrobial does not appear to be significantly different among plant accession or species.
- Burdock powder is more effective (creates a larger zone of inhibition) than whole burdock.

**Summary**

- Burdock is being used traditionally to treat burn wounds, but its efficacy lacks rigorous scientific evidence and thus is not supported by many physicians.
- Burdock does act as an antimicrobial but it is likely not the only benefit in the burn treatment because it is not as effective as other known antibiotics.
- Further research is needed to determine which yeast genes and potential human homologues have corresponding changes in their expression due to the presence of burdock.
- Preliminary studies were conducted on the role of burn wound salve (CytoPro) and its effects on overall antimicrobial activity.
- Further, it is suggested that burdock works in a cooperative manner with CytoPro and the body’s own cellular machinery in producing the observed beneficial effects of burdock in this burn treatment.

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