

NOPALOGY FRANCES WHITEHEAD

75 QUESTIONS FOR THE FUTURE

1. What is Nopal?
2. How is the Nopal different from other prickly pear cactus?
3. Are these differences primarily culinary?
4. Why is culinary Nopal named *Opuntia ficus-indica*?
5. Is *Opuntia ficus-indica* a species or a hybrid cultivar?
6. Why does Nopal have octoploid DNA?
7. What four species make up this hybridity?
8. Will the underlying species emerge when grown from seed?
9. Do Nopal grow true from seed?
10. Why is Nopal usually propagated vegetatively by cuttings?
11. Is Nopal seed viable?
12. Why does the Nopal produce so many seeds?
13. Why is it so hard to germinate Nopal seed?
14. Does the seed have germination inhibitors?
15. Does the germination reflect other evolutionary factors?
16. Is the germination effected by other species?
17. Is the germination effected by cultural practice?
18. Is the germination effected by temperature?

19. How far north does Nopal grow?
20. Could it be bred to survive in the temperate zone?
21. Why do we want cold-hardy Nopal?
22. Is Nopal an important future food?
23. Can Nopal contribute to global food security?
24. Is Nopal nutritious?
25. How does it produce nutrition from poor soil?
26. How does it grow in alkaline soil?
27. How does it grow with so little water?

28. How do we breed a cold-hardy Nopal?
29. Can we use a traditional breeding program?
30. Does low germination limit a breeding program?
31. Does hybridity limit a breeding program?
32. Do we have adequate genetic resources for breeding?
33. Who holds these resources?
34. How long will it take for a vegetative breeding program?
35. How long will it take for a breeding program using seeds?
36. Do we have time?
37. What can we learn from DNA analysis?
38. Is future food security worth risking a GM breeding program?
39. What are the technological futures of Nopal?
40. What is the past, present and future of Nopal?

41. What is the history of Nopal?
42. Where in Mexico was Nopal first grown?
43. What is the center of origin of *Opuntia*?
44. How long has Nopal been under cultivation?
45. What is the agri + culture of Nopal?
46. Are these cultural aspects primarily culinary?
47. Are these cultural aspects primarily place-based?
48. What does the Nopal mean in Mexico?
49. What can the Nopal mean outside Mexico?

50. Who knows how to grow Nopal?
51. Who first grew it?
52. Who grows it now?
53. Is this cultivation knowledge production?
54. What do the growers know?
55. What does the Nopal know?
56. Is this cultivation cultural production?
57. Does this culture reflect human activity?
58. Does this culture reflect multi-species cooperation?
59. Does this culture reflect plant consciousness?
60. Does this culture reflect plant knowledge?
61. What is known?
62. What is not known?
63. What is forgotten?

64. Why are the Nopal fruits called Tunas?
65. Why does Nopal produce such colorful fruit?
66. Why did the Nopal fruit evolve with betalain pigments?
67. What is the evolutionary advantage of these pigments?
68. What are the aesthetic potentials of these pigments?
69. How does the history of cochineal inform these aesthetics?
70. Why do cochineal insects prefer *Opuntia*?
71. What is the history + politics of cochineal carmine?
72. How do betalain pigments compare with carmine red?
73. Can betalain pigments replace toxic chemical pigments?
74. Can artists access betalain pigments?
75. With these pigments does the Nopal speak for itself?

PHOTO CREDIT: FRANCES WHITEHEAD, 2023



FRANCES WHITEHEAD IS A TRANSDISCIPLINARY ARTIST BRINGING THE METHODS, MINDSETS, AND STRATEGIES OF CONTEMPORARY ART PRACTICE TO IMAGINE POSSIBILITIES FOR THE FUTURE. DEPLOYING THE KNOWLEDGE OF ARTISTS AS CHANGE AGENTS, SHE ASKS, WHAT DO ARTISTS KNOW? WHITEHEAD'S EXPERIMENTAL MODALITIES ARE DRIVEN BY HER LIFELONG INVOLVEMENT WITH PLANTS, WHICH HAVE INFORMED HER WORK IN THE GREAT LAKES REGION. SHE HAS RECENTLY RELOCATED TO SANTA FE, NEW MEXICO, TO FOCUS ON XERIC PLANTS AND NEW ECOLOGIES FOR THE FUTURE.