



Chestnut Chat Series Q&A
Chat 32: Evolution of Castanea
Date: January 21, 2022

Question	Asker Name	Asker Email	Answer
Have you all read Donald Edward Davis's " The American Chestnut an environmental history".	Ken	heyKB11@yahoo.com	live answered
can you link to the recording?	Anonymous Attendee		live answered
how do you control the invasion of the weevil into the chestnuts?	sander	sander2726@gmail.com	hi Sander - the best thing to do is good sanitation. If you have weevils in your chestnuts, be sure to pick up all nuts and burs at the time of harvest to reduce how many weevils get in the ground and re-infest. We recommend harvesting as soon as possible, even straight from the tree. You can treat nuts in 120F water for 20 minutes. That will kill the weevil egg but not the chestnut embryo. That temperature is very important. Much higher than 120F and you'll kill the embryo. Much lower than 120F and you won't kill the weevil egg. There are sprays for weevils that commercial growers use, but they are difficult to get the timing right.
What is the ancestral line/parent of Castanea?	nurul faridi	nfaridi@tamu.edu	live answered
I think his speakers may be on, so he's transmitting both what he says and what his speakers echo back.	John Hempel	hempel@earthlink.net	thanks, jOhn. We'll try that next.
Did timber type growth; i.e., ability to reach canopy in the North American forest, evolve as the tree moved into Europe and North America? Or did castanea start out in Asia as a timber type tree and was bred to have an orchard type growth by Asian growers selecting branchy trees to maximize nut production?	Mike Aucott	mlaucott@gmail.com	live answered
how far back in fossil record does chestnut go? what geological layer	frank	mathob@icloud.com	live answered
I have read where TACF or at least one of it's chapters had picked out a tree and is using that DNA sequence to determine what percentage/or if a tree is considered to be Castanea dentata.	Ken	heyKB11@yahoo.com	live answered
Ho wis this possible and who decides what tree it is?	Ken	heyKB11@yahoo.com	live answered
If the speakers are an issue, he could plug in headphones	Thomas Levesque	freetomme@yahoo.com	Thanks for the suggestion!
There are pictures in Donald Edward Davis book of American Chestnut leaf fossils from the Tertiary period discovered in Idaho...Taylor have you seen these pics?	Ken	heyKB11@yahoo.com	live answered
how old is the chinnese chestnut	Russel Boyer	kellyboyer81@yahoo.com	live answered



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are there mo fossils from china? if family originated there it would seem they would be more common than here.	frank	mathob@icloud.com	live answered
what was the climate chestnut was growing in the eocene?	frank	mathob@icloud.com	live answered
What are the characteristics that distinguish the genus Chrysolepis from Castanea? Can you see them in the Tertiary fossils from the western US (where we now find Chrysolepis but not Castanea)?	Doug Boucher	douglas.h.boucher@gmail.com	live answered
What about the environment or eras allow a lot of development in the nut in 6 million years, shown in your slides 56 MYA to 50 MYA, and the stability that seems to be the case for the last 50 million years?	Steve	srbarchitect@gmail.com	live answered
how deos chestnut seed travel	Russel Boyer	kellyboyer81@yahoo.com	Hi Russel - Chestnut seeds travel primarily with help from wildlife. Species that cache, or save the nuts for later, are most responsible for moving and "planting" them. This includes many rodent species, as well as birds, like blue jays. Since chestnut is a food for humans, we're responsible for moving them around as well.
The paleobotany of Castanea seems to be much older than the land bridges from Asia/Europe/Americas That seems inconsistent with the hypothesis an Asian origin of Castanea. Comments?	Anita Klein	aklein@unh.edu	live answered
Is there any showing of DNA seq differences for a particluar trait from C. mollissima to C. dentata? It is may be too early to ask this question.	nurul faridi	nfaridi@tamu.edu	live answered
Method of migration - easy to understand as human populations migrated, but what mediated migration of tree species 40 mya? Did animals transport nuts a few feet west each year?	Kent Wilcox	gailandkent@msn.com	Animals, primarily rodents and birds that cache nuts, help move nuts around.
Kent, Acorns can be moved 100s of yards, and presumably chestnut too.	Fred Hebard	mbiew@comcast.net	Thanks Fred!
Kent, Acorns can be moved 100s of yards, and presumably chestnut too.	Fred Hebard	mbiew@comcast.net	Thanks Fred - just curious to know if pigs, hogs, or other critters were the main consumers of nut 40 million years ago. Squirrels are great at replanting acorns today - but what did the job 40 mya?
Kent, Acorns can be moved hundreds of yards, and presumably chestnuts can too.	Fred Hebard	mbiew@comcast.net	Thanks Fred!



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oaks and chestnut occurred commonly together. however oaks are distributed over most of north america and down in central america. why did chestnut not follow this same distribution?	frank	mathob@icloud.com	Fred Hebard provided a good comment on this - there are several species of oaks, each with its own specific range. Chestnut has a fairly large range for a single species but was likely limited by temperatures and soil condition preferences.
okay.	Russel Boyer	kellyboyer81@yahoo.com	
current populations of dentata due to glaciation movements not climate preferences ?..	Drucilla Wrasse	druwrasse@gmail.com	Most likely the glacial movements impacted the initial movement. The populations pre-blight were then largely stopped by climate preferences. They likely would have kept moving north had they not been stopped by blight. We do see planted populations thriving in northern Michigan, central Maine, etc.
frank, There are many fewer species of chestnut than oak. The range of any one species of oak typically is about the size of the range of chestnut. The multiple spp of oak are responsible for its wide range. Now why the two genera differ in number of spp is a more difficult question.	Fred Hebard	mbiew@comcast.net	Thanks Fred - good note.
My Dad and I loved to eat chestnuts and have tried several times to reduce the # of weevils in the nuts we harvest. We have several trees raised from the seeds and have one very large which produces a large # of nuts, but most of the nuts contained the weevils. I do not understand if the weevil egg is in the nut heating to 120F to 140F would the weevil egg still show when you open the nut? How do you prevent the weevil egg from getting into the burs thus affecting the portion we eat?	sander	sander2726@gmail.com	Hi Sander. You should not heat the nut to 140F - that will kill the nut and introduce other things like mold. The best way to keep the nut from getting in there is reduce the amount of weevils in the first place. The way to do that is good sanitation. Pick up all burs and nuts and either treat and eat them, or destroy them ASAP. This keeps the weevils from going into the soil and producing the next generation. Yes, if you heat treat, the egg will still be in there, but if you treat early enough after harvest, you'll never notice it.
Davis's book refutes the current assumed native area of the American Chestnut based on his research.	Ken	heyKB11@yahoo.com	Hi Ken, the native range as mapped by Little isn't perfect, but it's pretty good. I recommend a 2-part series about the native range maps, how it was made, and what it means/doesn't mean is available in TACFs Journal --- Part 1 --- https://acf.org/wp-content/uploads/2020/12/FINAL_Chestnut_Fall2019.pdf Part 2 -- https://acf.org/wp-content/uploads/2021/05/FINAL_WEB_Chestnut_Winter2020.pdf
Just a comment: Would be interesting to characterize the ribosomal DNA in pumila, alabamensis and dentata.	nurul faridi	nfaridi@tamu.edu	live answered
Any speculation on what might drive convergent leaf shapes between alabamensis and dentata?	Jason Smith (he/him NYRP)	jsmith@nyrp.org	live answered



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Pure speculation - would there have some selective advantage to <i>C. alabamensis</i> vs. <i>C. pumila</i> in the southern region?	Kent Wilcox	gailandkent@msn.com	live answered
How are species (other than <i>dentata</i>) affected by <i>C. parasitica</i> ?	Fred Behringer	fbehinger@yahoo.com	Hi Fred - a few other species can host <i>C. parasitica</i> but without much impact. You can see swelling on some oak species, but not cankers like we see on <i>C. dentata</i> . On the other <i>Castanea</i> species you can still get cankers but they are typically very small - not noticeable on <i>molissima</i> and <i>crenata</i> , and moderately severe on <i>sativa</i>
How are species (other than <i>dentata</i>) affected by <i>C. parasitica</i> ?	Fred Behringer	fbehinger@yahoo.com	Thank you Kendra
Taylor, The <i>C. dentata</i> in your last photo is probably dying from blight. When that occurs, there is cluster of catkins at the ends of branches, which may be the origin of the upright character rather than a genetic origin.	Fred Hebard	mbiew@comcast.net	Thanks Fred! Taylor will have access to the full Q&A after the chat, in case he doesn't see this before the end of our time today.
can you comment on the varieties of <i>Chinquapin ashei</i> , <i>floridana</i> .	Anonymous Attendee		live answered
Just a technical note - since the presentation ended, the audio has been perfect, if that tells anything about what the problem was. Just the presentation sucking bandwidth, or something else?	John Hempel	hempel@earthlink.net	thanks, John. I think it was the presentation sucking bandwidth.
Just a technical note - since the presentation ended, the audio has been perfect, if that tells anything about what the problem was. Just the presentation sucking bandwidth, or something else?	John Hempel	hempel@earthlink.net	From the presentation stalling, his computer might be the bottleneck.
Just a technical note - since the presentation ended, the audio has been perfect, if that tells anything about what the problem was. Just the presentation sucking bandwidth, or something else?	John Hempel	hempel@earthlink.net	More reason to test equipment and transmissions prior to going live.
Just a technical note - since the presentation ended, the audio has been perfect, if that tells anything about what the problem was. Just the presentation sucking bandwidth, or something else?	John Hempel	hempel@earthlink.net	He did.
When did the western North American <i>Castanea</i> go extinct? How did these species relate to the modern extant species? Did they coexist with <i>dentata</i> ?	Erik Carlson	ehcarlo@syr.edu	live answered



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Which subspecies succumb to the blight and which do not?	Rod Walker	rodswalker@gmail.com	Castanea dentata and the North American chinquapins are susceptible to blight, sativa is moderately susceptible to blight, and the Asian species (mollissima, crenata, henryii, seguinii...) are all considered resistant. The resistant species can still host blight infections, but they don't typically succumb unless they are compromised in some way (stressed, diseased, etc.)
Which subspecies succumb to the blight and which do not?	Rod Walker	rodswalker@gmail.com	Would seem to reinforce the theory that the species migrated to North America via Europe.
Why are some chinquapins trees in the wild have 3 nuts in the burr instead of just 1 nut.	Anonymous Attendee		live answered
How do we know Castanea first emerged in Asia and not North America....how do we know the reverse is not true?	Ken	heyKB11@yahoo.com	live answered
There were many genera present in western states during the early Tertiary that are now found only in the eastern U.S. (elms, hickories, Celtis, and others besides chestnut). They disappeared with the rise of the coastal ranges, Cascades, and Sierras, which created a climate in the interior West that is very different (dry) from what we have in the East.	Kim Steiner	steiner@psu.edu	live answered
There were many genera present in western states during the early Tertiary that are now found only in the eastern U.S. (elms, hickories, Celtis, and others besides chestnut). They disappeared with the rise of the coastal ranges, Cascades, and Sierras, which created a climate in the interior West that is very different (dry) from what we have in the East.	Kim Steiner	steiner@psu.edu	Thank you that clarifies a lot.
Chrysolepis is evergreen.	Kim Steiner	steiner@psu.edu	live answered
why does castanea have so little diversity vs quercus?	frank	mathob@icloud.com	live answered
What does this mean: Wipe the shelves with hot soapy water or a disinfecting spray then wipe again with white vinegar, which is known to kill weevils. I do not understand what is meant "shelves"?	sander	sander2726@gmail.com	
Has hybridization been occurring in the last hundred years within states or counties from people spreading non pure chestnut?	Paul Anderson	paulranderson29@gmail.com	Most hybridization is intentional within the species. While hybridization does happen occasionally, there is not much evidence of hybridization translating into spread into the forest.