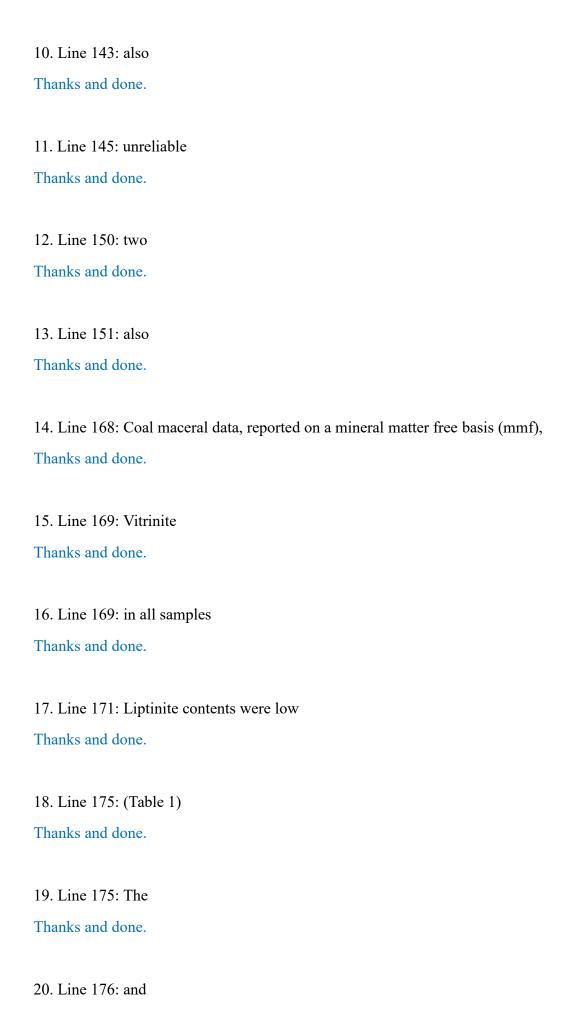
## Point-by-point responses (in blue) to the Editor and Reviewers' comments: Manuscript No.: cp-2024-42 Reviewer #2: 1. Line 34: published Thanks and done. 2. Line 35: P Thanks and done. 3. Line 52: Orbital periods Thanks and done. 4.Line 52: Whether Thanks and done. 5. Line 124: provide a better understanding Thanks and done. 6. Line 128: maceral composition Thanks and done. 7. Line 129: Vitrinite reflectance Thanks and done.

9. Line 135: and

8. Line 133: by

Thanks and done.



Thanks and done.
21. Line 180: VRo
Thanks and done.
22 I: 107 CC:
22. Line 187: coefficient
Thanks and done.
23. Line 187: I would not consider correlation coefficient of 0.529 to be "highly" significant.
Thanks for your suggestions. We have removed the description of 'highly'.
24. Line 188: a
Thanks and done.
25 I: 101
25. Line 191: a
Thanks and done.
26. Line 209: images
Thanks and done.
27. Line 216: In addition,
Thanks and done.
28. Line 220: vacuoles
Thanks and done.
29. Line 227: represent
Thanks and done.
Thums and done.
30. Line 240: represent

31. Line 243: have

Thanks and done.

32. Line 244: are likely

Thanks and done.

33. Line 247: thermally immature

Thanks and done.

34. Line 248: have

Thanks and done.

35. Line 249: at least

Thanks and done.

36. Line 253: This is actually a wide range of variability.

Thanks for your suggestion. The revisions have been completed.

37. Line 258: characteristics

Thanks and done.

38. Line 266: This is a wide range of variability

Thanks for your suggestion. The revisions have been completed.

39. Line 271: How do you know these are from fern tissues?

Thank you for your suggestion. I have added additional explanations regarding ferns and included the relevant references.

40. Line 297: does not correlate with

41. Line 320: What is a "closed" coal seam?

Thanks. It has been corrected.

42. Line 321: leaching

Thanks and done.

43. Line 325: activity

Thanks and done.

44. Line 326: emplaced

Thanks and done.

45. Line 342: influence

Thanks and done.

46. Line 353: is sensitive

Thanks and done.

47. Line 353: indicating

Thanks and done.

48. Line 354: indicating

Thanks and done.

49. Line 356: which are indicative of

Thanks and done.

50. Line 358: indicating

51. Line 360: drier Thanks and done. 52. Line 361: and Thanks and done. 53. Line 377: The peat literature suggests that peat accumulation events are much younger, typically between 8,000 and 10,000 years. Thank you for your suggestion. The No. 9 coal contains multiple layers of volcanic ash formed by volcanic activity (see Fig. 1), so 1.9 Ma represents the sedimentation age including both peat and volcanic ash. 54. Line 380: Maximum Thanks and done. 55. Line 383: with Thanks and done. 56. Line 383: levels Thanks and done. 57. Line 391: in reduced Thanks and done. 58. Line 397:, Thanks and done.

59. Line 401: volcanoes erupt Thanks and done.

60. Line 401: facilitate

Thanks and done.
61. Line 402: falls out on
Thanks and done.
62. Line 416: This is
Thanks and done.
63. Line 420: proliferates
Thanks and done.
64. Line 420: In
Thanks and done.
65. Line 422: frequency of
Thanks and done.
66. Line 422: is a function of
Thanks and done.
67. Line 423: Spatially,
Thanks and done.
68. Line 430: uncertain
Thanks and done.
69. Line 430: not representing the true situation at that time
Thanks and done.
70. Line: had
Thanks and done.

71. Line: of the Late Carboniferous