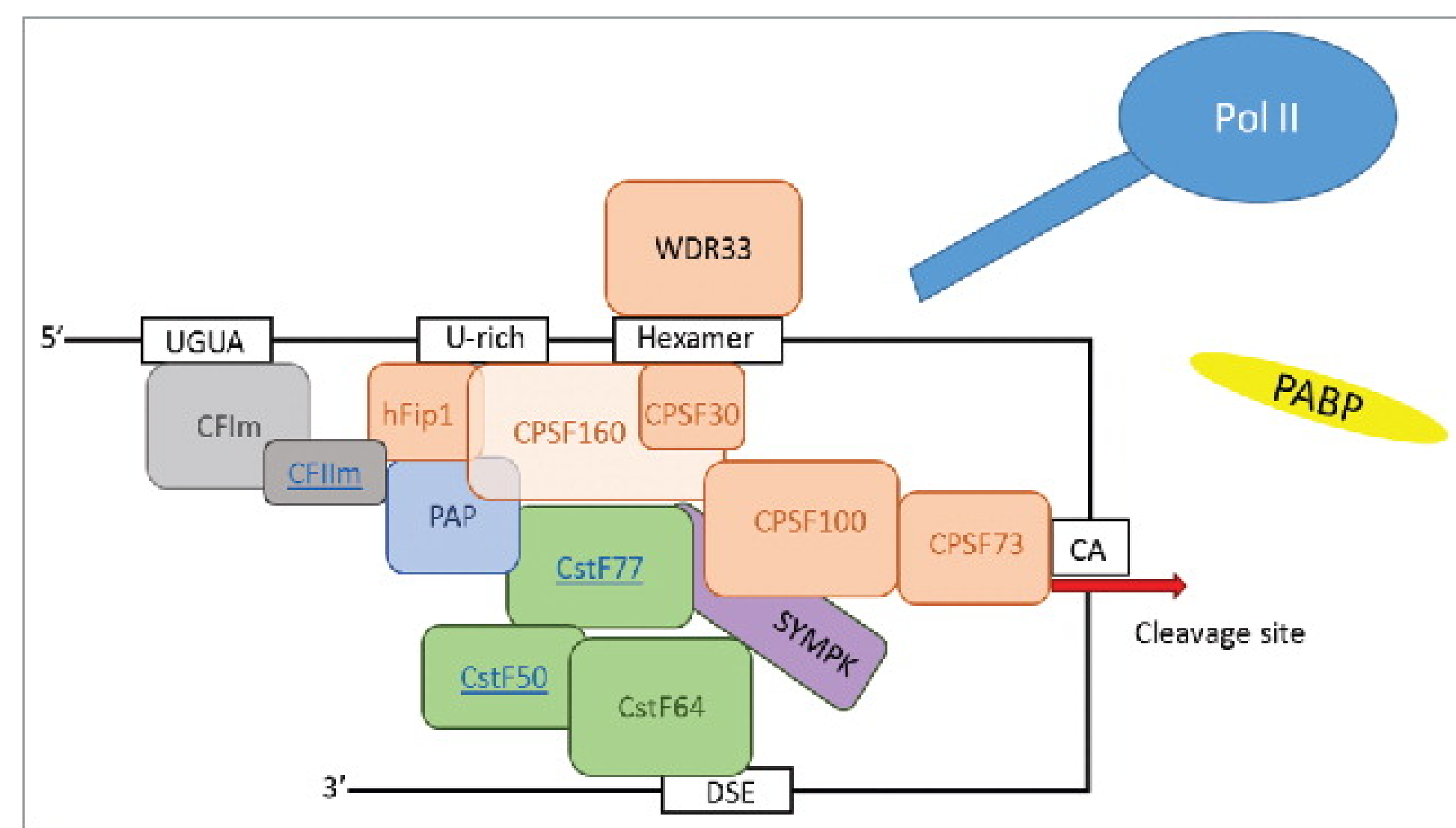


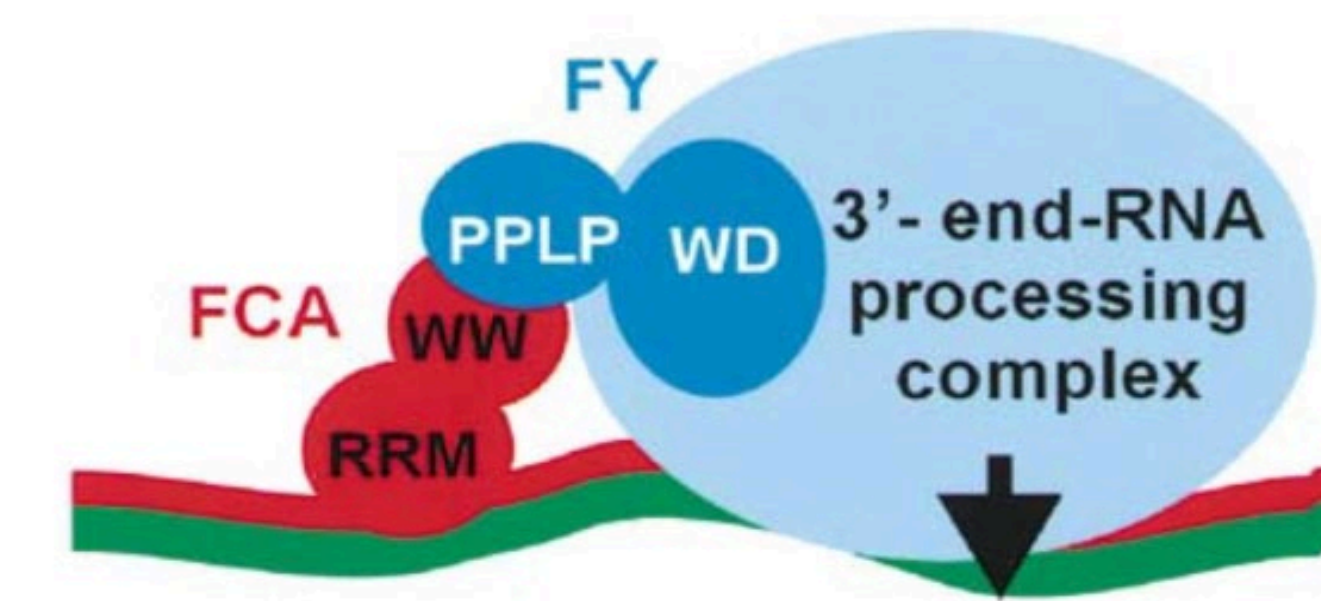
Background



Neve, Patel et al. 2017

- i. The polyadenylation complex plays catalyzes 3' end processing and mRNA polyadenylation.
- ii. Between 15 and 20 proteins are considered to be the core of the polyadenylation complex
- iii. In plants, the polyadenylation complex plays important roles in growth and development.

FY as an example



Simpson, Dijkwel et al. 2003

- iv. FY is the plant ortholog of WDR33. The FY C-terminal domain has two PPLPP motifs that interact with another protein, FCA.
- v. The FY-FCA interaction is important for flowering time but not for overall mRNA polyadenylation
- vi. -> the C-terminal domain has specialized functions

How does the C-terminal domain evolve? Is it under positive selection? Negative selection? Neutrally?

Methods and Results

Methods

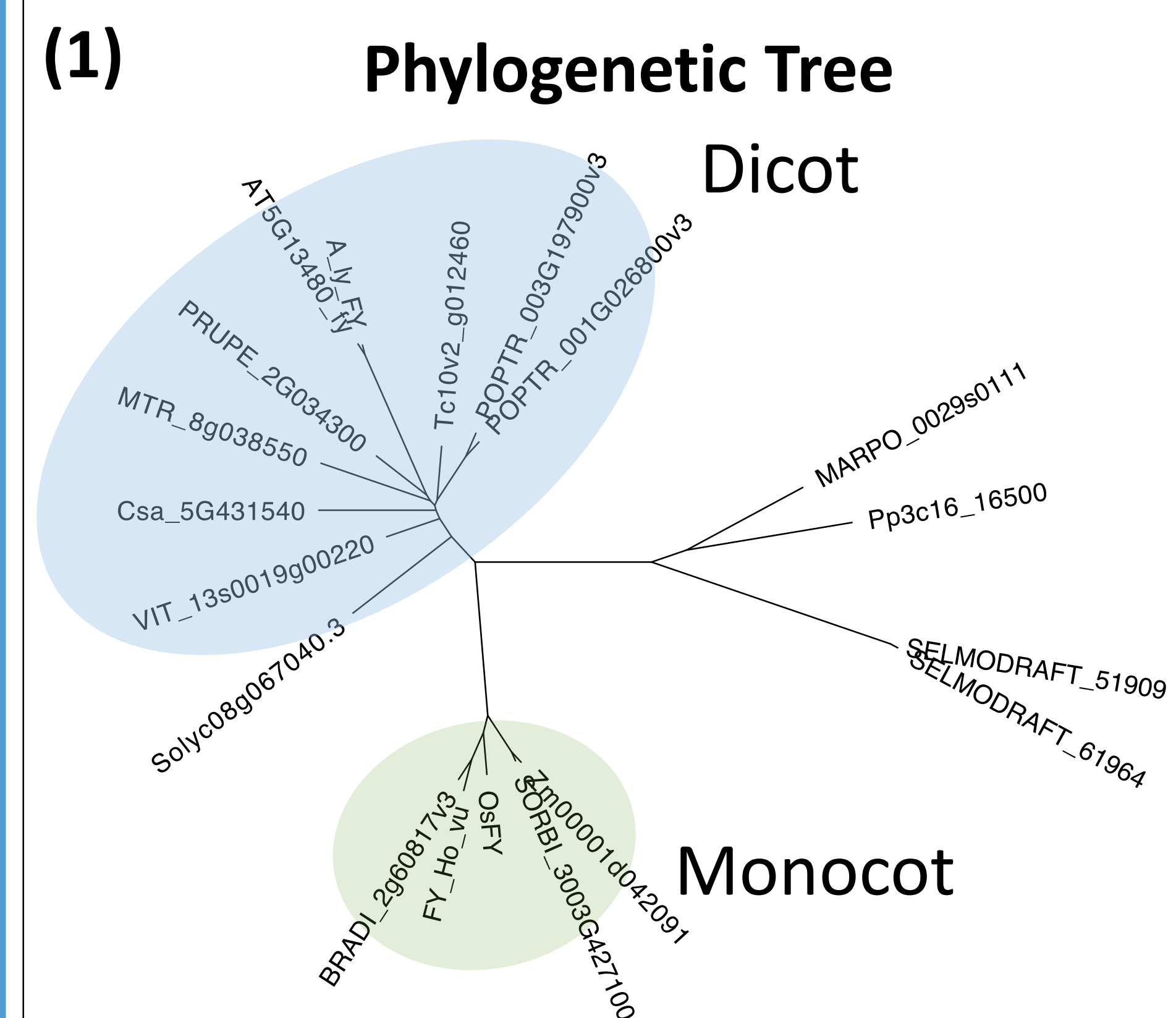
(a) **Blast**: compared FY sequences in 17 plant species

(b) **GUIDANCE**: Alignment

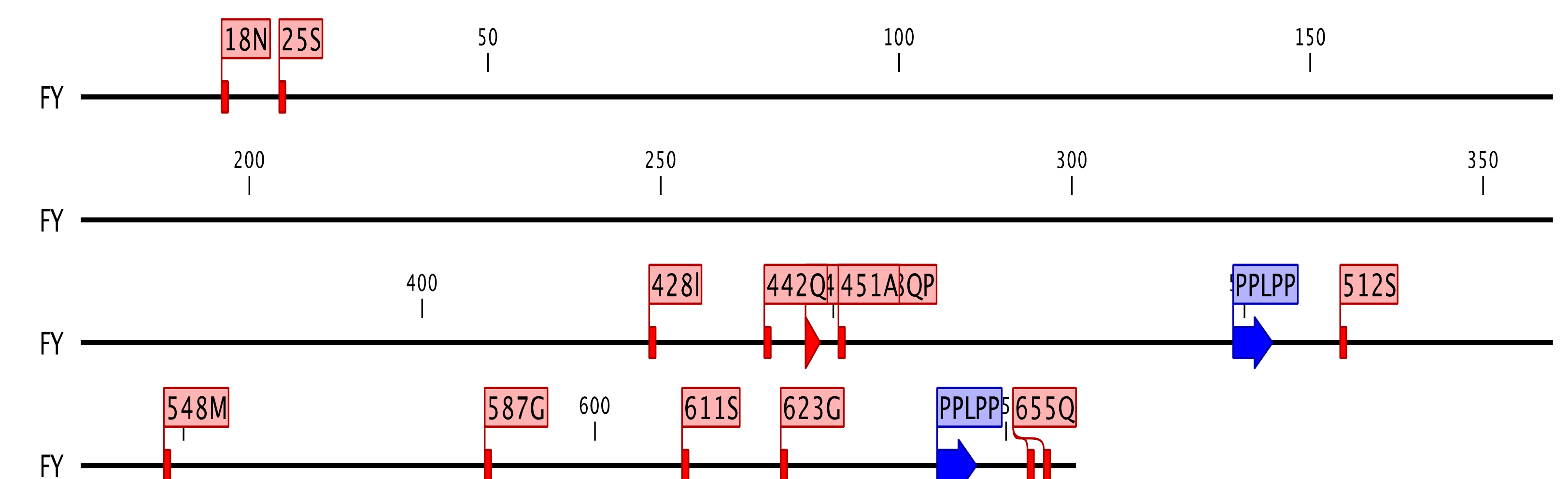
(c) **PhyML**: constructed phylogenetic tree

(d) **PAML**: the frequencies of synonymous and non-synonymous changes

Results:



(2) Positive Site in the FY CDS



Positive Site	18 N, 25 S, 428 L, 442 Q, 447 Q, 448 P, 451 A, 512 S, 548 M, 587 G, 611 S, 623 G, 653 N, 655 Q
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Conclusion

- (1) We found that the WD-containing domain is highly conserved and subject to purifying selection.
- (2) In contrast, the C-termini are much more divergent and seem to be under positive selection.

Future works:

- (1) In future work, we will expand this project to include all polyadenylation factors in plants.

Reference:

1. Neve, J., et al., *Cleavage and polyadenylation: Ending the message expands gene regulation*. Rna Biology, 2017. 14(7): p. 865-890.
2. Simpson, G.G., et al., *FY is an RNA 3' end-processing factor that interacts with FCA to control the Arabidopsis floral transition*. Cell, 2003. 113(6): p. 777-787.